

FENESTRATION ACCEPTANCE

CEC-NRCA-ENV-02-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-ENV-02-F
Fenestration Acceptance		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: The Enforcement Agency may optionally verify any Fenestration being installed for authenticity by accessing <http://cmast.nfrc.org/Project/CertificateFind.aspx> for NFRC CMAST Certificate Labels or NFRC Certificate Labels <http://search.nfrc.org/search/searchDefault.aspx> See Reference Nonresidential Appendix NA7 for additional information.

A. BUILDING INFORMATION

BUILDING TYPE:	<input type="checkbox"/> Low-rise Nonresidential	<input type="checkbox"/> Low-rise Schools	<input type="checkbox"/> High Rise Residential	<input type="checkbox"/> Hotel/Motel Guest Room		
PHASE OF CONSTRUCTION:	<input type="checkbox"/> New Building Construction		<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration		
TYPE OF LABEL CERTIFICATE:	<input type="checkbox"/> Rated NFRC Component Modeling Approach (CMA) Label Certificate or NFRC Certified Label		<input type="checkbox"/> NRCC-ENV-05-E - FC-1 for Nonrated Fenestration Values < 1,000 ft ²	<input type="checkbox"/> NRCC-ENV-05-E - FC-1 for Nonrated Fenestration Values ≥ 1,000 ft ²		
TYPE OF INSTALLED FENESTRATION:	<input type="checkbox"/> Vertical Fenestration	<input type="checkbox"/> Tubular Daylighting Device (TDD)	<input type="checkbox"/> Skylight	<input type="checkbox"/> Dynamic Glazing	<input type="checkbox"/> Window Film	<input type="checkbox"/> Block Glass

B. STATEMENT OF ACCEPTANCE

This Certificate of Acceptance summarizes the results of the Acceptance test as specified in the Reference Nonresidential Appendix, NA7.4. Additional related references are in Sections §10-103(a)4, §10-111, §116(a)5 of the Energy Efficiency Standards.

SUMMARY OF FENESTRATION VERIFICATION AND INSPECTION BY RESPONSIBLE PARTY

Individuals who perform the field testing and verification work, and provide the information required for completion of the Certificate of Acceptance documentation are not required to be licensed professionals. However, the person who signs the Certificate of Acceptance document to certify compliance with the acceptance requirements shall be licensed as specified in Standards Section 10-103(a)4 and NA7.3.1.

The Responsible Person or Party shall verify the thermal performance (U-factor, SHGC and VT) of each specified fenestration product being installed matches the fenestration the NFRC Label Certificate, the CEC energy compliance documentation and building plans. Note: A maximum of 4 NFRC Product Listings for each Certificate of Acceptance.

For NFRC Rated Product (If more than 8 fenestration products use additional sheets)

<i>If Product is rated by NFRC then enter the ID # in each column. This includes any of the types of installed fenestration listed above.</i>	1	2	3	4
	NFRC Label Certificate ID #	NFRC Label Certificate ID #	NFRC Label Certificate ID #	NFRC Label Certificate ID #
	5	6	7	8
	NFRC Label Certificate ID #	NFRC Label Certificate ID #	NFRC Label Certificate ID #	NFRC Label Certificate ID #

For Nonrated Fenestration Attach a copy of the NRCC-ENV-05-E (previously known as FC-1)**For All Fenestration: Verify and Cross Reference:**

	1	2	3	4
<i>If receipts or orders are available and it identifies the NFRC ID# then cross reference against the NFRC Label Certificate to match ID#s; or</i>	<input type="checkbox"/> Delivery Receipt(s) <input type="checkbox"/> Purchase Order or <input type="checkbox"/> Detailed Receipt	<input type="checkbox"/> Delivery Receipt(s) <input type="checkbox"/> Purchase Order or <input type="checkbox"/> Detailed Receipt	<input type="checkbox"/> Delivery Receipt(s) <input type="checkbox"/> Purchase Order or <input type="checkbox"/> Detailed Receipt	<input type="checkbox"/> Delivery Receipt(s) <input type="checkbox"/> Purchase Order or <input type="checkbox"/> Detailed Receipt
<i>Cross reference the efficiencies listed on the NFRC Label Certificate of NRCC-ENV-05-E - FC-1 matches the building plans window schedule of efficiencies.</i>	<input type="checkbox"/> Cross Reference and Matches Building Plans	<input type="checkbox"/> Cross Reference and Matches Building Plans	<input type="checkbox"/> Cross Reference and Matches Building Plans	<input type="checkbox"/> Cross Reference and Matches Building Plans

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/HERS/ATT Certification Identification (If applicable):
City/State/Zip:	Phone:

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

AUTOMATIC DAYLIGHTING CONTROL ACCEPTANCE DOCUMENT

CEC-NRCA-LTI-03-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-LTI-02-A
Lighting Control Acceptance Document		(Page 1 of 6)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: For more than 3 spaces attach additional sets of pages 2 through 5, as required.</i>	Enforcement Agency Use: Checked by/Date
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Automatic Shut-off Controls: Automatic Time Switch Control and Occupant Sensor	
Intent:	Lights are turned off or set to a lower level when not needed per Section 110.9(a) & 130.1(c).
Guidance This acceptance test form must be filled out for all newly-installed lighting control systems of the following types: <ul style="list-style-type: none"> I. Automatic Time Switch Controls II. Occupancy Sensors III. Partial-OFF occupancy sensors IV. Partial-ON occupancy sensors (<u>only if used to claim a Power Adjustment Factor</u>) V. Occupancy Sensors serving small zones in large open plan offices (<u>only if used to claim a Power Adjustment Factor</u>) <p>For automatic daylighting controls use acceptance test form NRCA-LTI-03-A; for demand responsive lighting controls, use acceptance test form NRCA-LTI-04-A.</p> <p>The tests on this certificate are required by Section 140.6(a)2 and 130.4(a) of the Building Energy Efficiency Standards 2013. The tests themselves are described in Sections 140.6(a)2 and in Reference Appendix NA7.6.</p>	

A. Construction Inspection	
Fill out Section A to cover spaces 1 through 3 that are functionally tested under Section B. Make as many copies of pages 2-5 as are required to test all spaces in the building, and attach to page 1.	
Instruments needed to perform tests include, but are not limited to: hand-held amperage meter, power meter, or light meter	
1	Automatic Time Switch Controls Construction Inspection—confirm for all listed in Section B
a.	All automatic time switch controls are programmed for (check all):
<input type="checkbox"/>	Weekdays
<input type="checkbox"/>	Weekend
<input type="checkbox"/>	Holidays
b.	Document for the owner automatic time switch programming (check all):
<input type="checkbox"/>	Weekdays settings
<input type="checkbox"/>	Weekend settings
<input type="checkbox"/>	Holidays settings
<input type="checkbox"/>	Set-up settings
<input type="checkbox"/>	Preference program setting
<input type="checkbox"/>	Verify the correct time and date is properly set in the time switch
<input type="checkbox"/>	Verify the battery is installed and energized
<input type="checkbox"/>	Override time limit is no more than 2 hours
<input type="checkbox"/>	Occupant Sensors and Automatic Time Switch Controls have been certified to the Energy Commission in accordance with the applicable provision in Section 110.9 of the Standards, and model numbers for all such controls are listed on the Commission database as Certified Appliance and Control Devices
2	Occupancy Sensor Construction Inspection—confirm for all listed in Section B

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	?	Occupancy sensors are not located within four feet of any HVAC diffuser
	?	Ultrasonic occupancy sensors do not emit audible sound 5 feet from source

B. Functional Testing of Lighting Controls**Representative Spaces Selected**

For every space in the building, conduct functional tests I through V below if applicable. If there are several geometrically similar spaces that use the same lighting controls, test only one space and list in the cells below which "untested spaces" are represented by that tested space.

EXCEPTION: For buildings with up to seven (7) occupancy sensors, all occupancy sensors shall be tested. (NA7.6.2.3)

?	1	Tested space/ room name: _____ Space Type (office, corridor, etc) _____ Untested areas/rooms _____
?	2	Tested space/ room name: _____ Space Type (office, corridor, etc) _____ Untested areas/rooms _____
?	3	Tested space/ room name: _____ Space Type (office, corridor, etc) _____ Untested areas/rooms _____

Functional Tests		Tested Space Number		
Confirm compliance (Y/N) for all control system types (I-V) present in each space:				
1. Automatic Time Switch Controls		1	2	3
Step 1: Simulate occupied condition				
a.	All lights can be turned on and off by their respective area control switch	Y / N	Y / N	Y / N
b.	Verify the switch only operates lighting in the ceiling-height partitioned area in which the switch is located	Y / N	Y / N	Y / N
Step 2: Simulate unoccupied condition				
a.	All lighting, including emergency and egress lighting, turns off. Exempt lighting may remain on per Section 130.1(c)1 and 130.1(a)1.	Y / N	Y / N	Y / N
b.	Manual override switch allows only the lights in the selected ceiling height partitioned space where the override switch is located and remain on no longer than 2 hours (unless serving public areas and override switch is captive key type).	Y / N	Y / N	Y / N
Step 3: System returned to initial operating conditions		Y / N	Y / N	Y / N

2. Occupancy Sensors		1	2	3
Step 1: Simulate an unoccupied condition				
a.	Lights controlled by occupancy sensors turn off within a maximum of 30 minutes from start of an unoccupied condition per Standard Section 110.9(a)	Y / N	Y / N	Y / N
b.	The occupant sensor does not trigger a false "on" from movement in an area adjacent to the controlled space or from HVAC operation	Y / N	Y / N	Y / N
Step 2: Simulate an occupied condition				
a.	Status indicator or annunciator operates correctly	Y / N	Y / N	Y / N

AUTOMATIC DAYLIGHTING CONTROL ACCEPTANCE DOCUMENT

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b.	Lights controlled by occupancy sensors turn on immediately upon an occupied condition <i>OR</i> sensor indicates space is "occupied" and lights may be turned on manually	Y / N	Y / N	Y / N
Step 3: System returned to initial operating conditions		Y / N	Y / N	Y / N

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3. Partial Off Occupancy Sensor		1	2	3
Step 1: Simulate an unoccupied condition				
a.	Lights go to partial off state within a maximum of 30 minutes from start of an unoccupied condition per Standard Section 110.9(a)	Y / N	Y / N	Y / N
b.	The occupant sensor does not trigger a false "on" from movement in an area adjacent to the controlled space or from HVAC operation. For library book stacks or warehouse aisle, activity beyond the stack or aisle shall not activate the lighting in the aisle or stack.	Y / N	Y / N	Y / N
c.	In the partial off state, lighting shall consume no more than 50% of installed lighting power, or: <ul style="list-style-type: none"> No more than 60% of installed lighting power for metal halide or high pressure sodium lighting in warehouses. No more than 60% of installed lighting power for corridors and stairwells in which the installed lighting power is 80 percent or less of the value allowed under the Area Category Method. Light level may be used as a proxy for lighting power when measurements are taken	Y/N	Y / N	Y / N
Step 2: Simulate an occupied condition				
a.	The occupant sensing controls shall turn lights fully ON in each separately controlled areas, Immediately upon an occupied condition	Y / N	Y / N	Y / N

4. Partial On Occupancy Sensors		1	2	3
Step 1. -Simulate an occupied condition. Verify partial on operation.				
a.	Immediately upon an occupied condition, the first stage activates between 30 to 70% of the lighting automatically.	Y / N	Y / N	Y / N
b.	After the first stage occurs, manual switches allow an occupant to activate the alternate set of lights, activate 100% of the lighting power, and manually deactivate all of the lights.	Y / N	Y / N	Y / N
Step 2. Simulate an unoccupied condition				
a.	Both stages (automatic on and manual on) lights turn off within a maximum of 30 minutes from start of an unoccupied condition per Standard Section 110.9(a)	Y / N	Y / N	Y / N
b.	The occupant sensor does not trigger a false "on" from movement in an area adjacent to the controlled space or from HVAC operation	Y / N	Y / N	Y / N

5. Additional test for Occupancy Sensors Serving Small Zones in Office Spaces Larger than 250 Square Feet, to Qualify for a Power Adjustment Factor (PAF)		1	2	3
<i>First, complete Functional Test 2 (above) for each controlled zone</i>				
Step 1. Verify area served and compare actual PAF with claimed PAF. Refer to Functional Test II.				
a.	Area served by controlled lighting (square feet)			
b.	Enter PAF corresponding to controlled area from line (a) above (<125sf for PAF=0.4, 126-250sf for PAF=0.3, 251-500sf for PAF=0.2).			
c.	Enter PAF claimed for occupant sensor control in this space from the Certificate of Compliance			
d.	The PAF corresponding to the controlled area (line b), is less than or equal to the PAF claimed in the compliance documentation (line c)	Y / N	Y / N	Y / N
e.	Sensors shall not trigger in response to movement in adjacent walkways or workspaces.	Y / N	Y / N	Y / N

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f.	All steps are conducted in Functional Test 2 "Occupancy Sensor (On Off Control)" and all answers are Yes (Y)	Y / N	Y / N	Y / N
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C	Testing Results	PASS / FAIL	PASS / FAIL	PASS / FAIL
	I Automatic Time Switch Controls (all answers must be Y).			
	II Occupancy Sensor (On Off Control) (all answers must be Y).			
	III Partial Off Occupancy Sensor (all answers must be Y). For warehouses, library book stacks, corridors, stairwells in nonresidential buildings must also be accompanied by passing Test I or Test II.			
	IV Partial On Occupant Sensor for PAF (all answers must be Y).			
	V Occupant Sensor serving small zones for PAF (all answers must be Y). Also must pass Test II			

D.	Evaluation :
<input type="checkbox"/>	PASS: All applicable Construction Inspection responses are complete and all applicable Equipment Testing Requirements responses are positive (Y - yes)

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Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Documentation author's Declaration Statement		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
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Check boxes for all pages of this LTG-3A completed and included in this submittal	
<input type="checkbox"/> LTG-3A Page 2	Construction Inspection. This page required for all submittals.
<input type="checkbox"/> LTG-3A Page 3 & 4	Continuous dimming control functional performance test – watt-meter or amp-meter measurement
<input type="checkbox"/> LTG-3A Page 5 & 6	Stepped Switching/ Stepped Dimming functional performance test – watt-meter or amp-meter measurement
<input type="checkbox"/> LTG-3A Page 7 & 8	Continuous dimming control functional performance test – light meter power measurement, and default look-up table of fraction of rated power versus fraction of rated light output.
<input type="checkbox"/> LTG-3A Page 9 & 10	Stepped Switching/ Stepped Dimming functional performance test – based on light output

I. Construction Inspection NA-7.6.2.1
1 Drawing of Daylit Zone(s) must be shown on plans or attached to this form. Select one or both of the following:
<input type="checkbox"/> Shown on plans page #'s _____
<input type="checkbox"/> Daylit zones(s) drawn in on as-built plans (attached) page #'s _____

<i>Check box below if sampling method is used in accordance with NA7.6.2.1. If checked, attach a page with names of other controls in sample (only for buildings with > 5 daylight control systems, sample group glazing same orientation)</i>

Control System	System Name	Plans Page Number	Check if Tested Control is Representative of Sample	Applicable Control System		
				A	B	C
A	_____		<input type="checkbox"/>			
B	_____		<input type="checkbox"/>			
C	_____		<input type="checkbox"/>			
2 System Information						
Zone Type: Skylit (Sky), Primary Sidelit (PS), or Secondary Sidelit (SS)						
Control Type: Continuous Dimming with more than 10 light levels (C), Stepped Dimming (SD), Switching (SW)						
Design Footcandles: (enter number or "Unknown")						
3 Sensor and Controls						
Control Loop Type: Open Loop (OL), Closed Loop (CL)						
Sensor Location: Outside (O), Inside Skylight (IS), Near Windows facing out (NW), In Controlled Zone (CZ)						
Sensor Location is Appropriate to Control Loop Type: (Y/N) If control loop type is Open Loop (OL): Enter yes (Y) if location = Outside (O), Inside Skylight (IS), or Near Windows facing out (NW); otherwise, enter no (N). If Control loop type is Closed Loop (CL): Enter yes (Y) if location = In Controlled Zone (CZ); otherwise, enter no (N).						
Control Adjustments are in Appropriate Location (Y/N): Yes, If Readily Accessible or Yes if in Ceiling ≤ 11 ft , No for all other .						
4 Has documentation been provided by the installer:						
Installation Manuals and Calibration Instructions Provided to Building Owner: (Y/N)						
Location of Light Sensor on Plans: (Y/N)						
Location of Light Sensor on Plans: (Page Number)						

5 Separate Controls of Luminaires in Daylit Zones:

Are luminaires controlled by automatic daylighting controls only in daylit zones: (Y/N)

Separately circuited for daylit zones by windows and daylit zones under skylights: (Y/N)

6 Daylighting control device certification

Daylighting control has been certified in accordance with §110.9: (Y/N)

Construction Inspection PASS/FAIL. If all responses on this **Construction Inspection** page are complete and all Yes/No questions have a Yes (Y) response, the tests PASS; If any responses on this page are incomplete OR there are any no (N) responses, the tests **FAIL**

II. Functional Performance Testing – Continuous Dimming Systems NA-7.6.2.2

Power estimation using amp-meter measurement, or alternate option – watt-meter measurement

Complete all tests on page 3 of 10 (No Daylight Test, Full Daylight Test, and Partial Daylight Test) and fill out Pass/Fail section on Page 4 of 10.

Applicable Control System

A B C

System Information

a. Control Loop Type: Open Loop or Closed Loop? (**O or C**)

b. Indicate if Mandatory control - M (required for skylit zone or primary sidelit zone with installed general lighting power > 120 W); or Voluntary -V (**M, V**)

c. If automatic daylighting controls are mandatory, are all general lighting luminaires in daylit zones controlled by automatic daylight controls? (Y/N)

d. Documented **general lighting design footcandles**. (Enter footcandle value or “Unknown” (U))

e. **Power estimation method.** Measured Amps Multiplied by Volts, Volt-Amps (VA), alternate option is Measured Watts (W)

Step 1: Identify Reference Location (location where minimum daylight illuminance is measured in zone served by the controlled lighting.)

f. Method Used: Illuminance or Distance? (**I or D**)

Override daylight control system and drive electric lights to highest light level for the following:

g. **Highest light level fc** – enter measured footcandles (fc) from controlled electric lighting (does not include daylight illuminance)

h. **Full load Highest light level power.** Enter measured Amps times Volts, Volt-Amps (VA) or measured Watts.

i. Indicate whether this is Full Output (**FO**), or Task Tuned (Lumen Maintenance) (**TT**)

Step 2: No Daylight Test controls enabled & daylight less than 1 fc at reference location

j. Method Used: Night time manual measurement (**Night**), Night Time Illuminance Logging (**Log**), Cover Fenestration (**CF**), Cover Open Loop Photosensor (**COLP**)

k. **Reference Illuminance** (footcandles) as measured at **Reference Location** (see Step 1). Enter footcandles

l. **Enter Y if either of the following statements are true:**
[Reference Illuminance (line j)] / [Highest light level fc (line g)] > 70% when line i = FO? 90%? or
[Reference Illuminance (line j)] / [design footcandles (line d)] > 80%? (Y/ N)

Step 3: Full Daylight Test conducted when daylight greater than reference illuminance (line j)

m. Enter measured Amps Multiplied by Volts, Volt-Amps (VA) or measured Watts (W).

n. **System power reduction** enter $[1 - (\text{line m})/(\text{line h})]$ enter as percent.

o. Is System Power Reduction (line m) > 65% when line i = FO, or > 56% when line i = TT (**Y/N**)

p. With uncontrolled lights also on, no lamps are dimmed outside of daylit zone by same control mechanism or formula (**Y/N**)

q. Dimmed lamps have stable output (no perceptible visual flicker) (**Y/N**)

Step 4: Partial Daylight Test conducted when daylight between 60% and 95% of (line k)				
r.	Daylight illuminance (light level without electric light) measured at Reference Location (fc)			
s.	Daylight illuminance divided by the Reference Illuminance = (line r)/ (line k). Enter %.			
t.	Is Ratio of Daylight illuminance to Ref. illuminance (line s) between 60% and 95%? (Y/N)			
u.	Total (daylight + electric light) illuminance measured at the Reference Location (fc)			
v.	Total illuminance divided by the Reference Illuminance = (line u)/ (line k), Enter %			
w.	Is Total illuminance divided by the Reference illuminance (line u) between 100% and 150%? (Y/N)			

III. Evaluation :

☐ PASS: All applicable Construction Inspection responses on page 2 of 10 are complete and all applicable Functional Performance Testing Requirements responses are positive (Y - yes) (applicable questions on page 3 of 10 = c, k, n, o, p, s, v)

II. NA7.6.2.2 Functional Performance Testing – Stepped Switching/ Stepped Dimming Systems

Power estimation using watt-meter or amp-meter measurement

Complete all tests on pages 3 & 4 (No Daylight Test, Full Daylight Test, and Partial Daylight Test) and fill out Pass/Fail section on Page 6 of 10.

System Information		Applicable Control System		
		A	B	C
a.	Control Loop Type. Open Loop or Closed Loop? (O or C)			
b.	Indicate if Mandatory control - M (required for skylit zone or primary sidelit zone with installed general lighting power > 120 W); or Voluntary -V (M, V)			
c.	If automatic daylighting controls are mandatory, are all general lighting luminaires in daylight zones controlled by automatic daylight controls? (Y/N)			
d.	Power estimation method. Measured Watts (W), Measured Amps Multiplied by Volts, Volt-Amps (VA),			
Step 1: Identify Reference Location (location where minimum daylight illuminance is measured in zone served by the controlled lighting.)				
e.	Method Used: Illuminance or Distance? (I or D)			
Step 2: No Daylight Test (daylight less than 1 fc at reference location)				
f.	Method Used: Night time manual measurement (Night), Night Time Illuminance Logging (Log) attach plot of fc or power, Cover Fenestration (CF), Cover Photosensor (CP)			
g.	Reference Illuminance (foot-candles) measured at Reference Location			
h.	Enter measured Watts (W), or Amps Multiplied by Volts, Volt-Amps (VA)			
i.	Indicate whether this is Full Output (FO), or Task Tuned (Lumen Maintenance) (TT)			
Step 3: Full Daylight Test conducted when daylight > 150% of reference illuminance (line g)				
j.	Measured Watts of Volt-Amps - record system power			
k.	System fraction of power reduction = [1-(line k) / (line h)],			
l.	Is System Power Reduction (k) > 65% when line i = FO or >56% when line i = TT (Y/N)			
Step 4: Partial Daylight Test				
m.	Method Used: Light Logging (Log), Partially Cover Fenestration (PCF), Open Loop Setpoint Adjustment (OLSA)			

n.	If the control has three steps of control or less, all steps of control are tested. If the control has more than three steps, testing three steps of control is sufficient for showing compliance. Tests have been conducted at various daylight levels that correspond to steps of electric lighting control. (Y/N)			

II.NA7.6.2.2 Functional Performance Testing – Stepped Switching/ Stepped Dimming Systems (continued)

		Applicable Control System		
		A	B	C
	First Stage of Control			
F1	Total (daylight + electric light) illuminance measured at the Reference Location (foot-candles) when stage turns off or dims			
F2	Is the measured total illuminance between 100% and 150% of the Reference Illuminance (line g)? (Y/N)			
F3	With time delay disabled, control stage does not cycle (i.e. deadband is sufficient)? (Y/N)			
	Second Stage of Control			
F4	Total (daylight + electric light) illuminance measured at the Reference Location (foot-candles) when stage turns off or dims			
F5	Is the measured total illuminance between 100% and 150% of the Reference Illuminance (line g)? (Y/N)			
F6	With time delay disabled, control stage does not cycle (i.e. deadband is sufficient)? (Y/N)			
	Third Stage of Control			
F7	Total (daylight + electric light) illuminance measured at the Reference Location (foot-candles) when stage turns off or dims			
F8	Is the measured total illuminance between 100% and 150% of the Reference Illuminance (line g)? (Y/N)			
F9	With time delay disabled, control stage does not cycle (i.e. deadband is sufficient)? (Y/N)			
Step 5: Time Delay Test (conduct at least 60 minutes after overriding time delay)				
r.	After change of state from little daylight to full daylight, time in minutes before light output is reduced			
s.	Is the measured time delay (line r) greater than or equal to 3 minutes? (Y/N)			
III.	PASS/FAIL Evaluation (check one):			
<input type="checkbox"/>	PASS: All applicable Construction Inspection responses on page 2 of 10 are complete and all applicable Functional Performance Testing Requirements responses are positive (Y - yes) (applicable questions on pages 5 & 6 of 10 are on lines c, i, l, m, n, F2, F3, F5, F6, F8, F9, s)			
<input type="checkbox"/>	FAIL: Any applicable Construction Inspection responses on Page 2 are incomplete OR there is one or more negative (N - no) responses in any applicable Functional Performance Testing Requirements section (applicable questions on pages 5 & 6 of 10 are on lines c, i, l, m, n, F2, F3, F5, F6, F8, F9, s). System does not pass and is NOT eligible for Certificate of Occupancy according to Section 10-103(a)3B. Fix problem(s) and retest until the system(s) passes all portions of this test before retesting and resubmitting LTG-3A with PASSED test to the enforcement agency. Describe below the failure mode and corrective action needed.			

II. Functional Performance Testing – Continuous Dimming Systems NA-7.6.2.2

Power estimation using light meter measurement

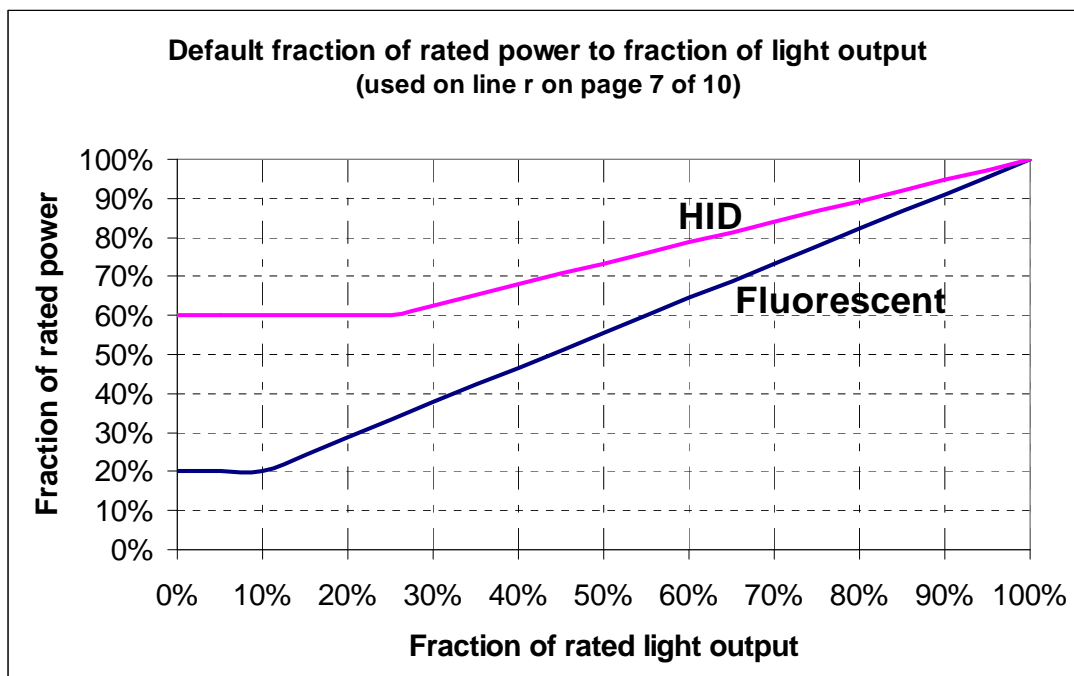
Complete all tests on page 7 & 8 of 10 (No Daylight Test, Full Daylight Test, and Partial Daylight Test) and fill out Pass/Fail section on Page 8 of 10.

		Applicable Control System		
		A	B	C
System Information				
a.	Control Loop Type: Open Loop or Closed Loop? (O or C)			
b.	Indicate if Mandatory control - M (required for skylit zone or primary sidelit zone with installed general lighting power > 120 W); for Control Credit – CC; or Voluntary not for credit -V (M, CC, V)			
c.	If automatic daylighting controls are mandatory, are all general lighting luminaires in daylight zones controlled by automatic daylight controls? (Y/N)			
d.	Documented general lighting design footcandles . If design footcandles not documented leave blank (enter fc)			
e.	Power estimation method. (see line r) Default ratio of power to light (Dfc), cut-sheet ratio of power to light (CSfc) If CSfc – attach cut-sheet. Enter Dfc or CSfc ,			
Step 1: Identify Reference Location (location where minimum daylight illuminance is measured in zone served by the controlled lighting.).				
f.	Method Used: Illuminance or Distance? (I or D)			
Override daylight control system and drive electric lights to full light output for highest light level fc.:				
g.	Highest light level fc – enter measured controlled electric lighting footcandles (fc)			
h.	Indicate whether this is Full Output (FO), or Task Tuned (Lumen Maintenance) (TT)			
Step 2: No Daylight Test				
i.	Method Used: Night time manual measurement (Night), Night Time Illuminance Logging (Log), Cover Fenestration (CF), Cover Open Loop Photosensor (COLP)			
j.	Reference Illuminance (footcandles) measured at Reference Location (Illuminance of general lighting at the reference location)			
k.	Enter Y if either of the following statements are true: If line h = FO; [Reference Illuminance (line i)] / [Full Output fc (line g)] > 70%? or [Reference Illuminance (line i)] / [design footcandles (line d)] > 80%? (Y/ N)			
Step 3: Full Daylight Test conducted when daylight > reference illuminance (line i)				
l.	Daylight illuminance (light level with electric lighting turned off) measured at Reference Location (fc)			
m.	Daylight illuminance (line l) greater than Reference Illuminance (line j) ? (Y/N)			
n.	Fraction controlled wattage turned off. Enter %.			
o.	Fraction of controlled wattage dimmed [1 – (line n)] Enter %.			
Fill out lines p through s only if fraction of controlled wattage turned off (line n) < 100%.				
p.	Total (daylight + electric light) illuminance measured at the Reference Location (fc)			
q.	Electric lighting illuminance at the Reference Location (fc) [(line p) – (line l)]			
r.	Electric lighting illuminance (line q) divided by Highest Light Level fc (line g). Enter %			
s.	Dimmed luminaire fraction of rated power. Attach manufacturer's cut-sheet or use default graph of rated power to light output on bottom of page 8 of 10. Label applicable control system (column A, B or C) on cut-sheet or graph. Enter fraction of rated power in %.			
t.	System Power Reduction = [1 – (line o) * (line s)]			
u.	Is System Power Reduction (line t) > 65% when line h = FO, or > 56% when line h = TT (Y/N)			
v.	With uncontrolled lights also on, no lamps dimmed outside of daylit zone by control (Y/N)			
w.	Dimmed lamps have stable output, no perceptible flicker (Y/N)			

II. Functional Performance Testing – Continuous Dimming Systems NA-7.6.2.2 (continued)

		Applicable Control System		
		A	B	C
Step 4: Partial Daylight Test conducted when daylight between 60% and 95% of (line i)				
x.	Daylight illuminance (light level without electric light) measured at Reference Location (fc)			
y.	Daylight illuminance divided by the Reference Illuminance = (line x)/ (line j). Enter %			
z.	Is Ratio of Daylight illuminance to Ref illuminance (line y) between 60% and 95%? (Y/N)			
aa.	Total (daylight + electric light) illuminance measured at the Reference Location (fc)			
bb.	Total illuminance divided by the Reference Illuminance = (line aa)/ (line j). Enter %			
cc.	Is Ratio of Total illum. to Reference illum. (line bb) between 100% and 150%? (Y/N)			

III.	PASS/FAIL Evaluation (check one):
<input type="checkbox"/>	PASS: All applicable Construction Inspection responses on page 2 of 10 are complete and all applicable Functional Performance Testing Requirements responses are positive (Y - yes) (applicable questions on page 7 of 10 = c, k, m, u, v, w, z, cc)
<input type="checkbox"/>	FAIL: Any applicable Construction Inspection responses on page 2 of 10 are incomplete OR there is one or more negative (N - no) responses in any applicable Functional Performance Testing Requirements section (applicable questions on page 7 of 10 = c, k, m, u, v, w, z, cc). System does not pass and is NOT eligible for Certificate of Occupancy according to Section 10-103(a)3B. Fix problem(s) and retest until the system(s) passes all portions of this test before retesting and resubmitting LTG-3A with PASSED test to the enforcement agency. Describe below the failure mode and corrective action needed.



II. NA7.6.2.2 Functional Performance Testing – Stepped Switching/ Stepped Dimming Systems

Power estimation based on light output

Complete all tests on page 9 & 10 of 10 (No Daylight Test, Full Daylight Test, and Partial Daylight Test) and fill out Pass/Fail section on Page 10 of 10.

Applicable Control System

A B C

System Information

- a. Open Loop or Closed Loop? (**O or C**)
- b. Indicate if Mandatory control - M (skylit zone or primary sidelit zone with installed general lighting power > 120 W)); for Control Credit – CC; or Voluntary not for credit -V (**M, CC, V**)
- c. If automatic daylighting controls are mandatory, are all general lighting luminaires in daylight zones controlled by automatic daylight controls? (Y/N)
- d. **Power estimation method.** Counting (C) – not allowed for step dimming, Counting plus Cut Sheet (C+CS) attach ballast cut sheet with steps of power and light.

Step 1: Identify Reference Location (location where minimum daylight illuminance is measured in zone served by the controlled lighting.)

- e. Method Used: Illuminance or Distance? (**I or D**)

Step 2: No Daylight Test

- f. Method Used: Night time manual measurement (**Night**), Night Time Illuminance Logging (**Log**) attach plot of fc or power, Cover Fenestration (**CF**), Cover Photosensor (**CP**)
- g. Reference Illuminance (foot-candles) measured at Reference Location
- h. Indicate whether this is Full Output (**FO**), or Task Tuned (Lumen Maintenance) (**TT**)

Step 3: Full Daylight Test conducted when daylight > 150 percent of reference illuminance (line g)

- i. Fraction system wattage turned off
- j. Fraction of system wattage dimmed
- k. Step dimming level as a fraction of rated light output if applicable
- l. Dimmed ballast fraction of rated power from cut-sheet
- m. **System Power Reduction** = $[1 - (\text{line j}) * (\text{line l})]$
- n. Is System Power Reduction (line m) > 65% when line i = FO or >56% when line i = TT (Y/N)
- o. With uncontrolled lights also on, no lamps controlled outside of daylit zone (Y/N)
- p. Dimmed lamps have stable output, no perceptible visual flicker (Y/N)

Step 4: Partial Daylight Test

- q. Method Used: Light Logging (**Log**), Partially Cover Fenestration (**PCF**), Open Loop Setpoint Adjustment (**OLSA**)
- r. If the control has three steps of control or less, all steps of control are tested. If the control has more than three steps, testing three steps of control is sufficient for showing compliance. Tests have been conducted at various daylight levels that correspond to steps of electric lighting control. (Y/N)

II.NA7.6.1.2Functional Performance Testing – Stepped Switching/ Stepped Dimming Systems (continued)

Applicable Control System

A B C

First Stage of Control

- F1 Total (daylight + electric light) illuminance measured at the Reference Location (foot-candles) when stage turns off or dims
- F2 Is the measured total illuminance between 100% and 150% of the Reference Illuminance (line g)? (Y/N)

F3	With time delay disabled, control stage does not cycle (i.e. deadband is sufficient)? (Y/N)			
Second Stage of Control				
F4	Total (daylight + electric light) illuminance measured at the Reference Location (foot-candles) when stage turns off or dims			
F5	Is the measured total illuminance between 100% and 150% of the Reference Illuminance (line g)? (Y/N)			
F6	With time delay disabled, control stage does not cycle (i.e. deadband is sufficient)? (Y/N)			
Third Stage of Control				
F7	Total (daylight + electric light) illuminance measured at the Reference Location (foot-candles) when stage turns off or dims			
F8	Is the measured total illuminance between 100% and 150% of the Reference Illuminance (line g)? (Y/N)			
F9	With time delay disabled, control stage does not cycle (i.e. deadband is sufficient)? (Y/N)			
Step 5: Time Delay Test (conduct at least 60 minutes after overriding time delay)				
s.	After change of state from little daylight to full daylight, time in minutes before light output is reduced			
t.	Is the measured time delay (line s) greater than or equal to 3 minutes? (Y/N)			
III.	PASS/FAIL Evaluation (check one): <input type="checkbox"/> PASS: All applicable Construction Inspection responses on page 2 of 10 are complete and all applicable Functional Performance Testing Requirements responses are positive (Y - yes) (applicable questions on pages 9 & 10 of 10 are on lines c, h, n, o, p, r, F2, F3, F5, F6, F8, F9, t) <input type="checkbox"/> FAIL: Any applicable Construction Inspection responses on page 2 of 10 are incomplete OR there is one or more negative (N - no) responses in any applicable Functional Performance Testing Requirements section (applicable questions on pages 9 & 10 of 10 are on lines c, h, h, o, p, r, F2, F3, F5, F6, F8, F9, t). System does not pass and is NOT eligible for Certificate of Occupancy according to Section 10-103(a)3B. Fix problem(s) and retest until the system(s) passes all portions of this test before retesting and resubmitting LTG-3A with PASSED test to the enforcement agency. Describe below the failure mode and corrective action needed.			

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

- I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

DEMAND RESPONSIVE LIGHTING CONTROL ACCEPTANCE DOCUMENT

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CERTIFICATE OF ACCEPTANCE		NRCA-LTI-04-A
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Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Demand Responsive Lighting Control

Intent: Test the reduction in lighting power due to the demand responsive lighting control as per Sections 110.9(a), 130.1(e) and 130.5(e).

NA7.6.7 Acceptance tests for Demand Responsive Lighting Controls in accordance with Section 130.1(e)

1	Instrumentation to perform test includes, but not limited to:
a.	Hand-held amperage and voltage meter
b.	Power meter
c.	Light meter

2	Construction Inspection	<p><input type="checkbox"/> Verify the demand responsive control is capable of receiving a demand response signal directly or indirectly through another device and that it complies with the requirements in Section 130.5(e).</p>
	130.5(e)	Demand responsive controls and equipment shall be capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal.
	Definition	DEMAND RESPONSE SIGNAL is a signal sent by the local utility, Independent System Operator (ISO), or designated curtailment service provider or aggregator, to a customer, indicating a price or a request to modify electricity consumption, for a limited time period.
	<input type="checkbox"/>	If the demand response signal is received from another device (such as an EMCS), that system must itself be capable of receiving a demand response signal from a utility meter or other external source.

NA7.6.7.2 Functional Test

<input type="checkbox"/>	1	Use <u>either</u> Method 1 (illuminance measurement) or Method 2 (power input measurement) to perform the functional test.
<input type="checkbox"/>	2	Test building-wide reduction in lighting power to at least 15% below the maximum total lighting power, as calculated on an area-weighted basis (measured in illuminance or power). However, any single space must not reduce the combined illuminance from daylight and electric light to less than 50% of the design illuminance.
<input type="checkbox"/>	3	For buildings with up to seven (7) enclosed spaces requiring demand responsive lighting controls, all spaces shall be tested.
<input type="checkbox"/>	4	For buildings with more than seven (7) enclosed spaces requiring demand responsive lighting controls, sampling may be done on additional spaces with similar lighting systems. If the first enclosed space with a demand responsive lighting control in the sample group passes the acceptance test, the remaining building spaces in the sample group also pass. If the first enclosed space with a demand responsive lighting control in the sample group fails the acceptance test the rest of the enclosed spaces in that group must be tested.
<input type="checkbox"/>	5	If any tested demand responsive lighting control system fails it shall be repaired, replaced or adjusted until it passes the test.

Method 1: Illuminance Measurement.
A. In each space, select one location for illuminance measurement. The chosen location must not be in a primary or secondary skylit or sidelit area, and when placed at the location, the illuminance meter must not have a direct view of a window or skylight. If this is not possible, perform the test at a time and location at which daylight illuminance provides less than half of the design illuminance. Mark each location to ensure that the illuminance meter can be accurately located.

Step 1: Full output test		Space number						
		1	2	3	4	5	6	7
a.	Using the manual switches/dimmers in each space, set the lighting system to design full output. Note that the lighting in areas with photocontrols or occupancy/vacancy sensors							

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	may be at less than full output, or may be off.							
b.	Take one illuminance measurement at a representative location in each space, using an illuminance meter.	fc	fc	fc	fc	fc	fc	fc
c.	Simulate a demand response condition using the demand responsive control.							
d.	Take one illuminance measurement at the same locations as above, with the electric lighting system in the demand response condition.	fc	fc	fc	fc	fc	fc	fc
e.	Turn off the electric lighting and measure the daylighting at the same location (if present)	fc	fc	fc	fc	fc	fc	fc
f.	Calculate the reduction in illuminance in the demand response condition, compared with the design full output condition. [((line b - line e) - (line d - line e)) / (line b - line e)]	%	%	%	%	%	%	%
g.	Note the area of each controlled space	sf	sf	sf	sf	sf	sf	sf
h.	The area-weighted reduction must be at least 0.15 (15%) but must not reduce the combined illuminance from electric light and daylight to less than 50% of the design illuminance in any individual space.	$\frac{(f1 \times g1) + (f2 \times g2) + (f3 \times g3)}{[g1 + g2 + g3 \dots]}$						
i.	The demand response signal must not reduce the power input of any individual circuit by more than 50%.	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N

continued on next page

Step 2: Minimum output test

a.	Using the manual switches/dimmers in each space, set the lighting system to minimum output (but not off). Note that the lighting in areas with photocontrols or occupancy/vacancy sensors may be at more than minimum output, or may be off.							
b.	Take one illuminance measurement at each location, using an illuminance meter.	fc	fc	fc	fc	fc	fc	fc
c.	Simulate a demand response condition using the demand responsive control.							
d.	Take one illuminance measurement at each location with the electric lighting system in the demand response condition.	fc	fc	fc	fc	fc	fc	fc
e.	In each space, the illuminance in the demand response condition must not be less than the illuminance in the minimum output condition or 50% of the design illuminance, whichever is less.	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N

EXCEPTION: In daylit spaces, the illuminance in the demand response condition maybe below the minimum output setting, but in the demand response condition the combined illuminance from daylight and electric light must be at least 50% of the design illuminance.

B. Method 2: Power Input Measurement.

At the lighting circuit panel, select at least one lighting circuit that serves spaces required to meet Section 130.1(b) to

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	measure the reduction in electrical current. Alternatively, employ the power monitoring capabilities of the DR controls system to monitor the circuits in the tests below. The testing process is constant with either approach.								
Circuit number									
Step 1: Full output test	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%;"></td> <td style="width: 12.5%; text-align: center;">1</td> <td style="width: 12.5%; text-align: center;">2</td> <td style="width: 12.5%; text-align: center;">3</td> <td style="width: 12.5%; text-align: center;">4</td> <td style="width: 12.5%; text-align: center;">5</td> <td style="width: 12.5%; text-align: center;">6</td> <td style="width: 12.5%; text-align: center;">7</td> </tr> </table>		1	2	3	4	5	6	7
	1	2	3	4	5	6	7		
a.	Using the manual switches/dimmers in each space, set the lighting system to full output. Note that the lighting in areas with photocontrols or occupancy/vacancy sensors may be at less than full output, or may be off.								
b.	Take one electric power measurement for each selected circuit.								
c.	Simulate a demand response condition using the demand responsive control.								
d.	Take one electric power measurement at each circuit location with the electric lighting system in the demand response condition.								
e.	Calculate the reduction in lighting power in the demand response condition, compared with the full output condition [(b-d)/b]								
f.	Note the area of each controlled space								
g.	Calculate the area-weighted average reduction in electric power in the demand response condition, compared with the full output condition. The area-weighted reduction must be at least 15%								
h.	The demand response signal must not reduce the power input of any individual circuit by more than 50%.								
Step 2: Minimum output test									
a.	Using the manual switches/dimmers in each space, set the lighting system to minimum output (but not off). Note that the lighting in areas with photocontrols or occupancy/vacancy sensors may be at more than minimum output, or may be off.								
continued on next page									
b.	Take one electric power measurement for each selected circuit location.								
c.	Simulate a demand response condition using the demand responsive control.								
d.	Take one electric power measurement at each circuit with the electric lighting system in the demand response condition.								
e.	In each space, the electric power input in the demand response condition must not be less than the power input in the minimum light output condition or 50% of the design illuminance power input condition, whichever is less.								

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EXCEPTION: Circuits that supply power to the daylit portion of enclosed spaces as long as lighting in non-daylit portions of the space are not reduced below the lesser of 50% power input level or the minimum light output condition.

C.	Evaluation :
<input type="checkbox"/>	PASS: All applicable Construction Inspection responses are complete and all applicable Equipment Testing Requirements responses are positive (Y - yes)

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
<ul style="list-style-type: none"> I certify that this Certificate of Acceptance documentation is accurate and complete. 		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

OUTDOOR LIGHTING ACCEPTANCE TESTS

CEC-NRCA-LTO-02-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-LTO-02-A
Outdoor Lighting Acceptance Tests		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

NA7.8.1.2 Outdoor Motion Sensor Acceptance

Intent: Luminaires that can accept an incandescent lamp (for instance, screw-base fixtures) rated over 100W are controlled with a motion sensor per Section 130.2(a).
Luminaires mounted 24 feet or below are controlled with a motion sensor per Section 130.2(c)3A

A. Construction Inspection**1. Motion Sensor Construction Inspection**

- | | |
|--------------------------|---|
| <input type="checkbox"/> | Motion sensor has been located to minimize false signals |
| <input type="checkbox"/> | Sensor is not triggered by motion outside of controlled area |
| <input type="checkbox"/> | Desired motion sensor coverage is not blocked by obstruction that could adversely affect performance |
| <input type="checkbox"/> | The lighting power of each luminaire is set to reduce by at least 40 percent but no more than 80 percent, in the unoccupied condition |
| <input type="checkbox"/> | No more than 1,500 watts of lighting power is controlled together, by the same sensor or group of sensors |

B. Functional testing**1. Simulate motion of a pedestrian in area under lights controlled by the motion sensor. Verify and document the following:**

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Status indicator operates correctly. |
| <input type="checkbox"/> | Lights controlled by motion sensors turn on immediately upon entry into the area lit by the controlled lights near the motion sensor |
| <input type="checkbox"/> | Signal sensitivity is adequate to achieve desired control |

2. Simulate no motion in area with lighting controlled by the sensor but with pedestrian motion adjacent to this area. Verify and document the following:

- | | |
|--------------------------|--|
| <input type="checkbox"/> | The occupant sensor does not trigger a false "on" from movement outside of the controlled area |
| <input type="checkbox"/> | Signal sensitivity is adequate to achieve desired control. |

NA7.8.2 Outdoor Lighting Automatic Shut-off Controls Acceptance

Intent: All installed outdoor lighting shall be controlled by a photocontrol or outdoor astronomical time-switch control that automatically turns OFF the outdoor lighting when daylight is available, per Section 130.2(c)1. All outdoor lighting shall also be controlled by an automatic scheduling control that automatically turns OFF the lighting outside of business hours or occupied times. Certain types of outdoor lighting shall also be controlled by motion sensor controls. Outdoor lighting shall be circuited separately from other electrical loads.

C. Construction Inspection**1. Outdoor Lighting Daytime Shut-off Controls**

- | | |
|--------------------------|---|
| <input type="checkbox"/> | All outdoor lighting is controlled either by a photocontrol or outdoor astronomical time-switch control that automatically turns OFF the outdoor lighting when daylight is available |
| <input type="checkbox"/> | Astronomical time switch controls and photocontrols have been certified to the Energy Commission in accordance with the applicable provision in Standards Section 110.9. Verify that model numbers of all such controls are listed on the Energy Commission database as "Certified Appliances & Control Devices." |
| <input type="checkbox"/> | If an astronomical time switch is installed, the ON and OFF times should be within 99 minutes of sunrise and sunset. Verify that the controller is programmed with the location of the site, local date and time. Disconnect controller from power source, reconnect, and verify that all programmed settings are retained. |

2. Outdoor Lighting Scheduling (Night-Time Shut Off) Controls

- | | |
|--------------------------|--|
| <input type="checkbox"/> | All outdoor lighting is controlled by a scheduling control, which is either a time clock or astronomical time clock. . |
|--------------------------|--|

OUTDOOR LIGHTING ACCEPTANCE TESTS

CEC-NRCA-LTO-02-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-LTO-02-A
Outdoor Lighting Acceptance Tests		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

	<input type="checkbox"/>	Controls are programmed with acceptable weekday, weekend, and holiday (if applicable) schedules
	<input type="checkbox"/>	Controls have been certified to the Energy Commission in accordance with the applicable provision in Standards Section 110.9. Verify that model numbers of all such controls are listed on the Energy Commission database as "Certified Appliances & Control Devices."
	<input type="checkbox"/>	Demonstrate and document for the owner time switch programming including weekday, weekend, holiday schedules as well as all set-up and preference program settings
3.		Lighting systems that meet the criteria of Section 130.2(c)4 and 5 of the Standards shall have <u>at least one of the following</u> :
	<input type="checkbox"/>	A part-night outdoor lighting control as defined in Section 100.1, which meets the functional requirements of NA7.7.2.4
	<input type="checkbox"/>	Motion sensors capable of automatically reducing lighting power by at least 40 percent but not exceeding 80 percent, which have auto-ON functionality, and which meets the requirements of NA7.7.1
	<input type="checkbox"/>	A centralized time-based zone lighting control capable of automatically reducing lighting power by at least 50 percent. This control shall be certified to the Commission in accordance with the applicable provision in Standards section 110.9. Verify that model numbers of all such controls are listed on the Energy Commission database as "Certified Appliances & Control Devices."
D. Functional Testing		
1.		Outdoor Lighting Daytime Shut-off Controls
	<input type="checkbox"/>	Controlled lights are off during daylight hours.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

- I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

OUTDOOR AIR ACCEPTANCE

CEC-NRCA-MCH-02-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-02-A
Outdoor Air Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Intent: *Verify measured outside airflow reading is within $\pm 10\%$ of the total required outside airflow. Required for all newly installed HVAC units. Reference MECH-3C (Column H or Column I) or Mechanical Equipment Schedules.*

Construction Inspection

Note: MCH-2A can be performed in conjunction with MCH-7A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.

1. Supporting documentation needed to perform test includes:
 - a. As-built and/or design documents (Mechanical Equipment Schedules).
 - b. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (NA7.5.1.1 Ventilation Systems: Variable Air Systems At-A-Glance and NA7.5.1.2 Constant Volume Systems Outdoor Air Acceptance At-A-Glance).
 - c. 2013 Building Energy Efficiency Standards.
2. Instrumentation needed to perform test includes:
 - a. Watch
 - b. Calibrated means to measure airflow (i.e. hot-wire anemometer, velocity pressure probe, etc.).
 1. Method and equipment used: _____
 2. Equipment calibration date (must be within one year): _____
3. System type (check either VAV or CAV): ☐ VAV ☐ CAV
 - ☐ Check if Variable Air Volume (VAV) and complete the following:
 - a. Outdoor airflow sensor (check one that applies):
 - ☐ Sensor used to control outdoor air flow is either factory calibrated or field calibrated.
 - ☐ Check if factory calibrated and attach calibration certification.
 - ☐ Check if field calibrated and attach calibration results.
 - b. Damper Control (must be checked):
 - ☐ Dynamic damper control is being used to control outside air. (This is NOT a fixed minimum position).
 - c. One of the following dynamic controls is being utilized to control outside air (check method used)
 - ☐ Dual Minimum Setpoint Design
 - ☐ Energy Balance Method
 - ☐ Return Fan Tracking
 - ☐ Airflow Measurement of the Entire Outdoor Air Inlet
 - ☐ Injection Fan Method
 - ☐ Dedicated Minimum Ventilation Damper with Pressure Control
 - ☐ Other Active Control, Describe: _____
 - ☐ Check if Constant Air Volume (CAV) and verify the following:
 - ☐ System is designed to provide a fixed minimum OSA when the unit is on.
4. Method of delivering outside air to the unit (check one of the following):
 - ☐ Outside air is ducted to the return air plenum.
 - a. Confirm that outside air is ducted to either (check one of the following):
 - ☐ Within five ft. of the unit.
 - ☐ Within 15 ft. of the unit, with the air directed substantially toward the unit, and with a discharge velocity of at least 500 ft. per minute.
 - ☐ Return air plenum is NOT used to distribute outside air to the unit. I.e. outside air is ducted directly to the unit or outside air is provided independent of the unit.
5. Pre-occupancy purge has been programmed for the 1-hour period immediately before the building is normally occupied to provide (one of the following methods must be verified and checked):
 - ☐ The conditioned floor area times the ventilation rate from the 2013 Building Energy Efficiency Standards TABLE 121-A, or 15 cfm per person times the expected number of occupants, whichever is less.
 - ☐ 3 complete air changes to the zone served by the air handler.

OUTDOOR AIR ACCEPTANCE

CEC-NRCA-MCH-02-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-02-A
Outdoor Air Acceptance		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

NA7.5.1.1 Outdoor Air Acceptance		
A. Functional Testing (Check appropriate column)	<input type="checkbox"/> CAV	<input type="checkbox"/> VAV
Step 1: Verify unit is not in economizer mode during test (economizer disabled).	<input type="checkbox"/>	<input type="checkbox"/>
<i>Note: Shaded boxes do not apply for CAV systems</i>		
Step 2: CAV and VAV testing at full supply airflow		
a. Adjust supply air to achieve design airflow or maximum airflow at full cooling. Record VFD speed (Hz).		Hz
b. Measured outdoor airflow reading (cfm)	cfm	cfm
c. Required outdoor airflow (cfm) (from MECH-3C, Column I, or Mechanical Equipment Schedules).	cfm	cfm
d. Time for outside air damper to stabilize after full supply airflow is achieved (minutes):		min
Step 3: VAV testing at reduced supply airflow	CAV	VAV
a. Adjust supply airflow to either the sum of the minimum zone airflows, full heating, or 30% of the total design airflow. Record VFD speed (Hz).		Hz
b. Measured outdoor airflow reading (cfm)		cfm
c. Required outdoor airflow (cfm) (from MECH-3C, Column I, or mechanical equipment schedules).		cfm
d. Time for outside air damper to stabilize after reduced supply airflow is achieved (minutes):		min
Step 4: Return to initial conditions (check)	<input type="checkbox"/>	<input type="checkbox"/>

B. Testing Calculations & Results		
Determine Percent Outside Air at full supply airflow (%OA _{FA}) for Step 2		
a. %OA _{FA} = Measured outdoor airflow reading / Required outdoor airflow (Step2b/Step2c)	%	%
b. %OA _{FA} is within 10% of design Outside Air. (90% ≤ %OA _{FA} ≤ 110%)	Y / N	Y / N
c. Outside air damper position stabilizes within 5 minutes (Step 2d < 5 minutes)		Y / N
Determine Percent Outside Air at reduced supply airflow (%OA _{RA}) for Step 3 (VAV only)		
a. %OA _{RA} = Measured outdoor airflow reading / Required outdoor airflow reading (Step3b/Step3c)		%
b. %OA _{RA} is within 10% of design Outside Air. (90% ≤ %OA _{RA} ≤ 110%)		Y / N
c. Outside air damper position stabilizes within 5 minutes (Step 3d < 5 minutes)		Y / N
Note: The intent of this test is to ensure that 1) all air handlers provide the minimum amount of OSA and 2) VAV air handlers use dynamic controls to avoid over ventilation.		

C.	Evaluation :
<input type="checkbox"/>	PASS: All Construction Inspection responses are complete and Testing Calculations & Results responses are positive (Y - yes)

OUTDOOR AIR ACCEPTANCE

CEC-NRCA-MCH-02-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-02-A
Outdoor Air Acceptance		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
<ul style="list-style-type: none"> I certify that this Certificate of Acceptance documentation is accurate and complete. 		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CONSTANT VOLUME SINGLE ZONE UNITARY (PACKAGED AND SPLIT) AIR CONDITIONER AND HEAT PUMP SYSTEMS

CEC-NRCA-MCH-03-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-03-A
Constant Volume Single Zone Unitary (Packaged and Split) Air Conditioner and Heat Pump Systems		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Construction Inspection

- Supporting documentation needed to perform test includes, but not limited to:
 - 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (NA7.5.2 Constant Volume, Single-zone, Unitary Air Conditioner and Heat Pumps Systems Acceptance At-A-Glance).
 - 2013 Building Energy Efficiency Standards Manual.
- Instrumentation to perform test includes, but not limited to:
 - None required
- Installation (check if applies):

☐ Thermostat is located within the space-conditioning zone that is served by the HVAC system.
- Programming (check all those that apply):

☐ Thermostat meets the temperature adjustment and dead band requirements of 2013 Building Energy Efficiency Standards Manual section 120.2(b).

Minimum heating setpoint: _____ °F. Maximum cooling setpoint _____ °F. Deadband: _____ °F.

☐ Occupied, unoccupied, and holiday schedules have been programmed per the facility's schedule.

☐ Pre-occupancy purge has been programmed to meet the requirements of 2013 Building Energy Efficiency Standards Manual section 120.1(c)2.

 - Check method used to determine pre-occupancy purge:

☐ Lesser of: conditioned floor area times ventilation rate from 2013 Building Energy Efficiency Standards TABLE 120.1-A or 15cfm per person times the expected number of occupants.

☐ 3 complete air changes.

Notes:

CONSTANT VOLUME SINGLE ZONE UNITARY (PACKAGED AND SPLIT) AIR CONDITIONER AND HEAT PUMP SYSTEMS

CEC-NRCA-MCH-03-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-03-A
Constant Volume Single Zone Unitary (Packaged and Split) Air Conditioner and Heat Pump Systems (Page 2 of 3)		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. Functional Testing Requirements	Operating Modes						
Step 1: Disable economizer control and demand-controlled ventilation (if applicable) to prevent unexpected interactions.							
<i>Occupied Mode</i>							
Step 2: Heating load during occupied condition							
Step 3: No-load during occupied condition							
Step 4: Cooling load during occupied condition							
<i>Unoccupied Mode</i>							
Step 5: No-load during unoccupied condition							
Step 6: Heating load during unoccupied condition							
Step 7: Cooling load during unoccupied condition							
Step 8: Manual override							
	8	7	6	5	4	3	2
Step 2 – 8: Check and verify the following for each simulation mode required							
a. Supply fan operates continually	?				?	?	?
b. Supply fan turns off				?			
c. Supply fan cycles on and off		?	?				
d. System reverts to "occupied" mode to satisfy any condition	?						
e. System turns off when manual override time period expires	?						
f. Gas-fired furnace, heat pump, or electric heater stages on			?				?
g. No heating is provided by the unit		?		?	?	?	
h. No cooling is provided by the unit			?	?		?	?
i. Compressor stages on		?			?		
j. Outside air damper is open to minimum position	?				?	?	?
k. Outside air damper closes completely		?	?	?			
Step 9: System returned to initial operating conditions after all tests have been completed:							
Y / N							

B. Testing Results	8	7	6	5	4	3	2
Indicate if Passed (P), Failed (F), or N/A (X), fill in appropriate letter							

C. Evaluation:	
?	PASS: All Construction Inspection responses are complete and all applicable Testing Results responses are "Pass" (P)

CONSTANT VOLUME SINGLE ZONE UNITARY (PACKAGED AND SPLIT) AIR CONDITIONER AND HEAT PUMP SYSTEMS

CEC-NRCA-MCH-03-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-03-A
Constant Volume Single Zone Unitary (Packaged and Split) Air Conditioner and Heat Pump Systems (Page 3 of 3)		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Documentation Author's Declaration Statement		
I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

DUCT LEAKAGE

CEC-NRCA-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-04-H
DUCT LEAKAGE		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance. HERS verification required.</i>	Enforcement Agency Use: Checked by/Date
---	---

This form used for duct pressure test and to certify low leakage air handlers. Fill out the System Information in section A then determine if this is a New Duct System (fill out Section B), an Altered Space Conditioning System and/or Altered Duct System (fill out Section C), or if the compliance software requires Low Leakage Air-Handling Unit Verification (fill out Section E)

A. System Information		
01	HVAC System Identification or Name:	
02	HVAC System Location or Area Served:	
03	Was Low Leakage Air-handling Unit Credit taken on MECH-1C?	<input type="checkbox"/> Yes/ <input type="checkbox"/> No
04	Duct System Construction Type:	
05	Condenser Nominal Cooling Capacity (ton)	
06	Heating Capacity (kBtu/h)	

B. Duct Leakage Diagnostic Test - New Duct System		
A New Duct System is when at least 75 percent of the duct system is new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material)		
01	Air-Handler Airflow Determination Method (Tons or BTU)	
02	Calculated Target Allowable Duct Leakage Rate (cfm) a) For an air conditioner or heat pump use 400 cfm per rated ton of cooling capacity of outdoor condenser or package unit. Calculation = $(.06 \times 400 \times \text{Tons } \underline{\hspace{1cm}}) = \underline{\hspace{1cm}} \text{ cfm}$ b) For heating-only system furnaces shall be based on 21.7 cfm per kBtu/hr of rated heating output capacity. Calculation = $(.06 \times 21.7 \times \text{kBtu/hr } \underline{\hspace{1cm}}) = \underline{\hspace{1cm}} \text{ cfm}$	
03	Actual duct leakage rate from leakage test measurement (cfm)	
04	Compliance statement:	
Pass - Pass if B3 is less than or equal to B2.		

C. Duct Leakage Diagnostic Test - Altered Space Conditioning System and/or Altered Duct System		
Altered Space Conditioning System – is an HVAC changeout or when the air handler, condensing unit of a split system, our cooling coil or any amount of ducting added to an existing system but less than a new duct system.		
01	Air-Handler Airflow Determination Method (Tons or BTU)	
02	Calculated Target Allowable Duct Leakage (cfm) a) For an air conditioner or heat pump use 400 cfm per rated ton of cooling capacity of outdoor condenser or a package unit. Calculation = $(.15 \times 400 \times \text{Tons } \underline{\hspace{1cm}}) = \underline{\hspace{1cm}} \text{ cfm}$ b) For heating-only system furnaces shall be based on 21.7 cfm per kBtu/hr of rated heating output capacity. Calculation = $(.15 \times 21.7 \times \text{kBtu/hr } \underline{\hspace{1cm}}) = \underline{\hspace{1cm}} \text{ cfm}$	
03	Actual duct leakage rate from leakage test measurement (cfm)	
04	Compliance statement:	
Pass - Pass if C3 is less than or equal to C2, or Fail but passed with Smoke – If unable to pass the leakage test a smoke test is allowed to confirm that all accessible leaks have been sealed. Enter actual leakage rate before moving to smoke. Fill out D Smoke Test below.		

DUCT LEAKAGE

CERTIFICATE OF ACCEPTANCE		NRCA-MCH-04-H
DUCT LEAKAGE		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

D. Smoke Test

01	Inject smoke into a fan pressurization device that is maintaining a duct pressure difference of 25 Pa (0.1 inches water) relative to the duct surroundings, with all grilles and registers in the duct system sealed.	
02	Compliance statement:	
Pass System passes if no smoke emanates from all accessible portions of the HVAC system including the package unit, furnace, ducts, plenums, wyes, tees. This includes the air handler refrigerant line, door panels, and curb. Accessible includes having access thereto, but which first may require removal or opening of access panels, doors, or similar obstructions including moving insulation. Requires 100% testing by HERS rater. No sampling allowed.		
03	Final Duct Leakage(CFM)	

E. Low Leakage Air-Handling Unit (LLAHU)

01	Installed Air-Handling Unit Manufacturer Name	
02	Installed Air-Handling Unit Model Number	
03	The installed Low Leakage Air-handling Unit Model is listed here http://www.energy.ca.gov/title24/2008standards/special_case_appliance/supplemental_listings/Low_Leakage_Air-Handling_Unit_Listing_2012-10-30.pdf	
04	Compliance statement:	
Pass if Manufacturer Name, Model Number of installed equipment is listed with the Energy Commission		

F. ADDITIONAL REQUIREMENTS FOR COMPLIANCE

01	System was tested in its normal operation condition. (No temporary taping except for the damper used for outside air)
02	Building cavities for new ducting were not used as plenums or platform returns in lieu of ducts.
03	If cloth backed tape was used it was covered with Mastic and draw bands.
04	All connection points between the air handler and the supply and return plenums are completely sealed including at the curb.
05	Temporary Taping over registers to perform duct leakage test. When registers are installed in drywall tape covers register and drywall. For t-bar mounted registers taping of register can occur to the register or to the t-bar.
By signing this document I certify that all the above applicable requirements have been met.	



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-04-H
DUCT LEAKAGE		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California: 1. The information provided on this Certificate of Acceptance is true and correct. 2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). 3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. 4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California: 1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. 2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance, and attest to the declarations in this statement (responsible acceptance person). 3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. 4. I understand that a HERS rater will check the installation to verify compliance, and that if such checking identifies defects the responsible builder/installer shall be required to take corrective action at his expense. I understand that Energy Commission and HERS Provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at the responsible builder/installer's expense. 5. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. 6. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

A. System Information

1. *HVAC System Identification or Name:* Provides an identification name or tag name that uniquely identifies the duct system. If there is a mechanical plan for the system, the tag name may be given on the plans.
2. *HVAC System Location or Area Served:* Provides a brief description of the area served by the duct system.
3. *Verified Low Leakage Air-handling Unit (VLLAHU) Credit:* Check Yes if Compliance Documentation for newly constructed buildings lists Low Leakage Air Handler Credit taken.
4. *Duct System Construction Type:* Choose from Completely New, Complete Replacement, or Alteration.
 - a. Completely New System: For new buildings with a new HVAC system.
 - b. Complete Replacement System: For existing buildings where a completely new duct system is installed (cut in) or 75 percent or more new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material).
 - c. Alteration: For existing buildings where ducting was added but less than Complete Replacement.
5. Enter the ton of condensing unit cooling capacity as specified by the manufacturer or NA if no air conditioning.
6. Enter the heat output of the in kBtu/hr

B. Duct Leakage Diagnostic Test - New Duct System

1. *Air-Handler Airflow Determination Method:* User will select from the following options:
 - a. Cooling System Method: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer.
 - b. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/hr of rated heating output capacity.
2. *Calculated Target Allowable Duct Leakage Rate (cfm):*
 - c) For an air conditioner or heat pump use 400 cfm per rated ton of cooling capacity of outdoor condenser or a package unit.
Calculation - $.06 \times 400 \times \text{Tons} = \text{cfm}$
 - d) Nominal air handler airflow for heating-only system furnaces shall be based on 21.7 cfm per kBtu/hr of rated heating output capacity. Calculation $.06 \times 21.7 \times \text{kBtu/hr} = \text{cfm}$
3. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm):* User will input this value from actual leakage test.
4. *Compliance Statement:* If Actual Duct Leakage Rate from leakage test (B3) is less than or equal to Calculated Target Allowable Duct Leakage Rate (B2) then test Passes.

C. Duct Leakage Diagnostic Test - Altered Space Conditioning System and/or Altered Duct System

1. *Air-Handler Airflow Determination Method:* User will select from the following options:
 - a. Cooling System Method: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer.
 - b. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/hr of rated heating output capacity.
2. *Calculated Target Allowable Duct Leakage Rate (cfm):*
 - e) For an air conditioner or heat pump use 400 cfm per rated ton of cooling capacity of outdoor condenser or a package unit.
Calculation - $.15 \times 400 \times \text{Tons} = \text{cfm}$
 - f) Nominal air handler airflow for heating-only system furnaces shall be based on 21.7 cfm per kBtu/hr of rated heating output capacity. Calculation $.15 \times 21.7 \times \text{kBtu/hr} = \text{cfm}$
3. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm):* User will input this value from actual leakage test.
4. *Compliance Statement:*
 - a. If Actual Duct Leakage Rate from leakage test (C3) is less than or equal to Calculated Target Allowable Duct Leakage Rate (B2) then test Passes.

- b. If the installer is unable to pass the leakage test a smoke test is allowed to confirm that all accessible leaks have been sealed. Enter actual leakage rate before conducting smoke test. Then go to section D Smoke Test below.

D. Smoke Test

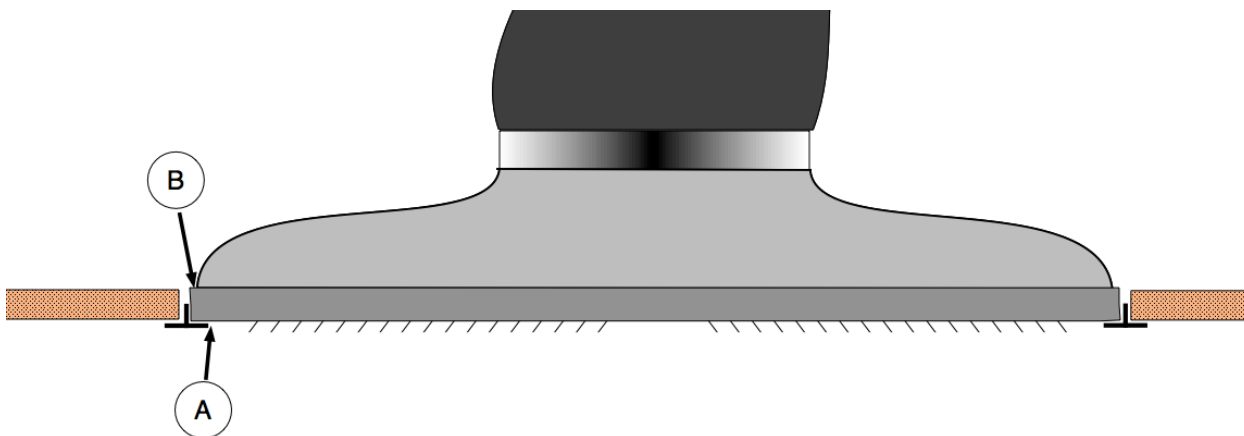
1. Pressurize duct system the same as a normal duct leakage test. Then inject theatrical smoke.
2. Test passes when: No smoke is allowed to emanates from all accessible portions of the HVAC system including the package unit, ducts, plenums, wyes, tees, air handler refrigerant line, door panels, and curb. Accessible includes having access thereto, but which first may require removal or opening of access panels, doors, or similar obstructions including moving insulation to access the leak. If there is small amounts of smoke emanating from under duct insulation and the location of the leak cannot be determined then in most situations this would not be required to be fixed. If there is large amount of smoke emanating from under the duct insulation and the leak are can be determined the insulation should be removed in the leakage area, duct fixed and the repaired. Requires 100% testing by HERS rater. No sampling allowed.

E. Low Leakage Air-Handling Unit (LLAHU)

1. Enter the Installed Air-Handling Unit Manufacturer Name
2. Enter the Installed Air-Handling Unit Model Number
3. The installed Low Leakage Air-handling Unit Model must be listed here
http://www.energy.ca.gov/title24/2008standards/special_case_appliance/supplemental_listings/Low_Leakage_Air-Handling_Unit_Listing_2012-10-30.pdf
4. Pass if the Manufacturer Name, Model Number of installed equipment is listed with the Energy Commission.

F. ADDITIONAL REQUIREMENTS FOR COMPLIANCE

1. When performing the duct test no temporary taping is allowed except for the damper used for outside air.
2. For newly installed ducting building cavities are not allowed.
3. Newly installed cloth backed tape must be covered with Mastic and draw bands.
4. All connection points between the air handler and the supply and return plenums are completely sealed including at the curb.
5. When performing the duct test all the registers must be taped closed. When a register is cut into drywall tape over the register and onto the drywall. For registers in t-bar ceilings then testers are allowed to temporarily tape at point A or B (see diagram below). If taping at point A and it passes, fine, some of the air may be going around the register. If anything, that makes it harder to pass. The installer and rater need to agree on which method they want to use. Taping to the edge of the register under the t-bar (by lifting up on the register) is a LOT more work but will likely result in a lower leakage test value than taping over the edge of the t-bar.



AIR ECONOMIZER CONTROLS ACCEPTANCE

CEC-NRCA-MCH-05-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-05-A
Air Economizer Controls Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>		Enforcement Agency Use: Checked by/Date

A. Construction Inspection
<p>1. Supporting documentation needed to perform test includes:</p> <ul style="list-style-type: none"> a. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (<i>NA7.5.4 Air Economizer Controls Acceptance At-A-Glance</i>). b. 2013 Building Energy Efficiency Standards.
<p>2. Instrumentation to perform test includes:</p> <ul style="list-style-type: none"> a. Hand-held temperature probe Calibration Date: _____ (must be within last year) b. Meter capable of measuring enthalpy Calibration Date: _____ (must be within last year) c. 1.2 k Ohm Resistor (for standalone package systems, i.e. non-DDC controls)
<p>3. Installation: (all of the following boxes should be checked)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Economizer lockout setpoint complies with Table 140.4-B found in the 2013 Building Energy Efficiency Standards Section 140.4(e)3. <input type="checkbox"/> Economizer reliability features are present per 2013 Building Energy Efficiency Standards Section 140.4(e)4: <ul style="list-style-type: none"> <input type="checkbox"/> A. 5-year manufacturer warranty of economizer assembly <input type="checkbox"/> B. Provide a product specification sheet proving capability of at least 60,000 actuations <input type="checkbox"/> C. Provide a product specification sheet proving economizer damper sections are certified by AMCA 511 for a maximum damper leakage rate of 10 cfm/sf at 1.0 in. w.g. (Class 1A, 1, and 2 are acceptable) <input type="checkbox"/> D. If the high limit setpoint is fixed dry-bulb or fixed enthalpy + fixed dry-bulb then the control shall have an adjustable setpoint <input type="checkbox"/> E. Outdoor air, return air, mixed air, and supply air sensors shall be calibrated as follows: <ul style="list-style-type: none"> i. Drybulb and wetbulb temperatures accurate to $\pm 2^{\circ}\text{F}$ over the range of 40°F to 80°F ii. Enthalpy accurate to ± 3 Btu/lb over the range of 20 Btu/lb to 36 Btu/lb iii. Relative humidity (RH) accurate to $\pm 5\%$ over the range of 20% to 80% RH <input type="checkbox"/> F. Check that the sensor performance curve(s) is provided by the factory and sensor output values measured during sensor calibration are plotted on the performance curve(s) <input type="checkbox"/> G. Sensors used for high limit control shall be located to prevent false readings, including but not limited to being properly shielded from direct sunlight. <input type="checkbox"/> For DX package units 65,000 Btu/hr or less, verify that a two-stage thermostat is used, and the system is wired so the economizer is the first stage of cooling and the compressor is the second stage <input type="checkbox"/> Unitary systems with an economizer have control systems, including two-stage or electronic thermostats, that cycle compressors off when economizers can provide partial cooling <input type="checkbox"/> System has return fan speed control, relief dampers, or dedicated relief fans to prevent building over pressurization in full economizer mode. <input type="checkbox"/> For systems with DDC controls, sensor used for economizer lockout has been factory or field calibrated. <input type="checkbox"/> For systems with non-DDC controls, manufacturer's startup and testing procedures have been applied.

AIR ECONOMIZER CONTROLS ACCEPTANCE

CEC-NRCA-MCH-05-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-05-A
Air Economizer Controls Acceptance		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

B. Functional Testing	Results
Step 1: Disable demand control ventilation systems (if applicable)	
Step 2: Enable the economizer and simulate a cooling demand large enough to drive the economizer fully open. Verify the following:	
a. Economizer damper modulates 100% open.	Y / N
b. Return air damper modulates 100% closed.	Y / N
c. For systems that meet the criteria of 2013 Building Energy Efficiency Standards Section 140.4(e)1, verify that the economizer remains 100% open with the use of mechanical cooling. This occurs when the cooling demand can no longer be met by the economizer alone.	Y / N
d. All applicable fans and dampers operate as intended to maintain building pressure.	Y / N
e. The unit heating is disabled (if applicable).	Y / N / NA
Step 3: Disable the economizer and simulate a cooling demand. Verify the following:	
a. Economizer damper closes to its minimum position.	Y / N
b. All applicable fans and dampers operate as intended to maintain building pressure.	Y / N
c. The unit heating is disabled (if applicable).	Y / N / NA
Step 4: If the unit is equipped with heating, simulate a heating demand and enable the economizer. Verify the following:	
a. Economizer damper closes to its minimum position.	Y / N / NA
b. Return air damper opens.	Y / N / NA
Step 5: Turn off the unit and verify the following:	
a. Economizer damper closes completely.	Y / N
Step 6: System returned to initial operating conditions	Y / N

C. Testing Results	PASS / FAIL	
Step 2: Simulate cooling load and enable the economizer (all answers are Y).		
Step 3: Simulate cooling load and disable the economizer (all answers are Y).		
Step 4: Simulate heating demand and enable the economizer (all answers are Y).		
Step 5: Turn off the unit (all answers are Y).		

D.	Evaluation :
<input checked="" type="checkbox"/>	PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"

Notes:	

AIR ECONOMIZER CONTROLS ACCEPTANCE

CEC-NRCA-MCH-05-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-05-A
Air Economizer Controls Acceptance		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Documentation Author's Declaration Statement		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

DEMAND CONTROL VENTILATION SYSTEMS ACCEPTANCE

CEC-NRCA-MCH-06-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-06-A
Demand Control Ventilation Systems Acceptance (Page 1 of 2)		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
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Intent:	<i>Verify that systems required to employ demand Controlled ventilation (refer to §121(c)3) can vary outside ventilation flow rates based on maintaining interior carbon dioxide (CO₂) concentration setpoints</i>
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Construction Inspection	
1	Instrumentation to perform test includes, but not limited to: <ul style="list-style-type: none"> a. Calibrated hand-held CO² analyzer b. Manufacturer's calibration kit c. Calibrated CO²/air mixtures
2	Installation <ul style="list-style-type: none"> <input type="checkbox"/> The sensor is located in the high density space between 3ft and 6 ft above the floor or at the anticipated level of the occupants' heads.
3	Documentation of all carbon dioxide control sensors includes (check one of the following): <ul style="list-style-type: none"> a. Calibration method <ul style="list-style-type: none"> <input type="checkbox"/> Factory-calibration certificate calibration cert must be attached <input type="checkbox"/> Field calibrated b. Sensor accuracy <ul style="list-style-type: none"> <input type="checkbox"/> Certified by manufacturer to be no more than +/- 75 ppm calibration cert must be attached

A. Functional Testing	Results
a. Disable economizer controls	
b. Outside air CO ² concentration (select one of the following)	
<input type="checkbox"/> Measured dynamically using CO ² sensor	_____ ppm
c. Interior CO ² concentration setpoint (Outside CO ² concentration + 600 ppm)	_____ ppm
Step 1: Simulate a signal at or slightly above the CO² setpoint or follow manufacturers recommended testing procedures.	
<input type="checkbox"/> For single zone units, outdoor air damper modulates opens to satisfy the total ventilation air called for in the Certificate of Compliance.	
<input type="checkbox"/> For multiple zone units, either outdoor air damper or zone damper modulate open to satisfy the zone ventilation requirements.	
Step 2: Simulate signal well below the CO² setpoint or follow manufacturers recommended procedures.	
<input type="checkbox"/> For single zone units, outdoor air damper modulates to the design minimum value.	
<input type="checkbox"/> For multiple zone units, either outdoor air damper or zone damper modulate to satisfy the reduced zone ventilation requirements.	
Step 3: System returned to initial operating conditions	Y / N
B. Testing Results	PASS / FAIL
Step 1: Simulate a high CO ² load (check box complete)	
Step 2: Simulate a low CO ² load (check box complete)	
C. Evaluation:	
<input type="checkbox"/> PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"	

DEMAND CONTROL VENTILATION SYSTEMS ACCEPTANCE

CEC-NRCA-MCH-06-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-06-A
Demand Control Ventilation Systems Acceptance		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

SUPPLY FAN VFD ACCEPTANCE

CEC-NRCA-MCH-07-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-07-A
Supply Fan VFD Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
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Intent:	<i>Verify that the supply fan speed in a variable air volume system modulates to meet system airflow demand.</i>
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Construction Inspection

Note: MECH-7A can be performed in conjunction with MECH-2A Outdoor Air Acceptance since testing activities overlap.

1. Supporting documentation needed to perform test includes:
 - a. As-built and/or Design Documents including Mechanical Equipment Schedules.
 - b. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (*NA7.5.6 Supply Fan Variable Flow Controls Acceptance At-A-Glance*).
 - c. 2013 Building Energy Efficiency Standards.
2. Instrumentation to perform test includes:
 - a. Calibrated differential pressure gauge.
 Date of calibration: _____ (*must be within one year*)
 - b. Pitot tube
 - c. Drill
3. Installation:
 - a. The static pressure location, setpoint, and reset control meets the requirements of 2013 Building Energy Efficiency Standards section 140.4(c)2C: (check all the following that apply).
 - ☐ If sensor is located downstream of major duct splits, multiple sensors are installed in each major branch with fan capacity controlled to satisfy the sensor furthest below its setpoint.
 - ☐ Set point is no greater than one-third of the total design fan static pressure.
 Design TSP: _____ in. w.c. Setpoint: _____ in.w.c.
 - ☐ If system has DDC to the zone level it has reset control complying with 2013 Building Energy Efficiency Standards Section 140.4(c) 2D. Reset is based on the zone requiring the most pressure; i.e., the set point is reset lower until one zone damper is nearly wide open.
4. Field calibrate all discharge static pressure sensors:
 - ☐ Performed field-calibration using calibrated differential pressure gauge and pitot tube.
 - ☐ Calibration complete, all pressure sensors within 10% of calibrated reference sensor (provide supporting documentation).

Notes:

SUPPLY FAN VFD ACCEPTANCE

CEC-NRCA-MCH-07-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-07-A
Supply Fan VFD Acceptance		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. Functional Testing	Results
Step 1: Drive all VAV boxes to full design airflow.	
a. Refer to design documents and record system design airflow.	cfm
b. Supply fan speed modulates to increase capacity.	Y / N
c. Record fan VFD speed:	Hz
d. Supply fan maintains discharge static pressure within +/-10% of the current operating set point. If NA, indicate reason in Notes section.	Y / N / NA
Note: If NOT performing this test in conjunction with MECH-2A, other methods for verifying VFD operation include increasing static pressure setpoint or putting all the VAV boxes into full cooling. Was one of these methods used? <i>Due to diversity in system design, static pressure setpoint will likely not be achieved when all VAV boxes are in full cooling. If this occurs, verify fan speed is 60 Hz and indicate NA in step 1.d.</i>	Y / N
e. Verify that supply fan controls stabilize within a 5 minute period.	Y / N
Notes:	
Step 2: Drive all VAV boxes to reduced or minimum airflow.	
a. Supply fan speed modulates to decrease capacity.	Y / N
b. Record fan VFD speed:	Hz
c. Current operating static pressure setpoint has decreased (for systems with DDC to the zone level).	Y / N / NA
d. Supply fan maintains discharge static pressure within +/-10% of the current operating setpoint.	Y / N
e. Supply fan controls stabilize within a 5 minute period.	Y / N
Notes:	
Step 3: System returned to initial operating conditions	
	Y / N

B. Testing Results	PASS	/		FAIL
Step 1: Drive all VAV boxes to achieve full design airflow (Pass if all answers are Yes)	<input type="checkbox"/>			<input type="checkbox"/>
Step 2: Drive all VAV boxes to minimum flow (Pass if all answers are Yes)	<input type="checkbox"/>			<input type="checkbox"/>

C. Evaluation:
<input type="checkbox"/> PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"
Notes:
Documentation Author's Declaration Statement

SUPPLY FAN VFD ACCEPTANCE

CEC-NRCA-MCH-07-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-07-A
Supply Fan VFD Acceptance		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/HERS/ATT Certification Identification (If applicable):
City/State/Zip:	Phone:

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
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5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:



CERTIFICATE OF ACCEPTANCE - DATA FIELD DEFINITIONS AND CALCULATIONS

NRCA-MCH-08-A
 A

Valve Leakage Test

(Page 2 of 2) 2 of 2)

Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/HERS/ATT Certification Identification (If applicable):
City/State/Zip:	Phone:

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Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:

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- I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
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- I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
- I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

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Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

SUPPLY WATER TEMPERATURE RESET CONTROLS ACCEPTANCE

CERTIFICATE OF ACCEPTANCE		NRCA-MCH-09-F
Supply Water Temperature Control		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>		Enforcement Agency Use: Checked by/Date

Intent:	Ensure that both the chilled water and hot water supply temperatures are automatically reset based on either building loads or outdoor air temperature, as indicated in the control sequences.
Construction Inspection	
1. Supporting documentation needed to perform test includes, but not limited to: <ul style="list-style-type: none"> a. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (NA7.5.8 Supply Water Temperature Reset Controls Acceptance At-A-Glance) 2. Instrumentation to perform test includes, but is not limited to: <ul style="list-style-type: none"> a. Calibrated reference temperature sensor, icewater, or drywell bath. <ul style="list-style-type: none"> 1. Calibration Date: _____ (must be within last year). 3. Document that hydronic system supply temperature sensor(s) have been field calibrated: (check the following that apply): <ul style="list-style-type: none"> <input type="checkbox"/> Field-calibrated by TAB contractor or other. <ul style="list-style-type: none"> <input type="checkbox"/> Calibration complete, hydronic system supply temperature sensors within 1% of calibrated reference sensor, icewater or drywell bath. <input type="checkbox"/> Provide supporting documentation. <input type="checkbox"/> Performed field-calibration using calibrated reference temperature sensor or drywell bath. <ul style="list-style-type: none"> <input type="checkbox"/> Calibration complete, hydronic system supply temperature sensors within 1% of calibrated reference sensor, icewater or drywell bath. (Provide supporting documentation). 	

A. Functional Testing	Results
Step 1: Test Maximum Reset Value	
a. Change reset control variable to its maximum value. This can be accomplished by any one of the following (check method):	<input type="checkbox"/>
<input type="checkbox"/> Commanding at least one coil valve to 100% open	
<input type="checkbox"/> Adjust discharge air temperature or zone temperature setpoints to drive a valve into a 100% open.	
<input type="checkbox"/> Override actual outdoor air sensor to exceed maximum water temperature boundary value.	
b. Verify that chilled or hot water temperature setpoint is reset to appropriate value.	Y / N
c. Verify that actual system temperature changes to within 2% of the new setpoint.	Y / N
Step 2: Test Minimum Reset Value	
a. Change reset control variable to its minimum value	<input type="checkbox"/>
b. Verify that chilled or hot water temperature setpoint is reset to appropriate value	Y / N
c. Verify that actual system temperature changes to within 2% of the new setpoint	Y / N
Step 3: Test Automatic Control of Reset Control Variable.	
a. Restore reset control variable to automatic control	<input type="checkbox"/>
b. Verify that chilled or hot water temperature setpoint is reset to appropriate value	Y / N
c. Verify that actual supply temperature changes to meet setpoint	Y / N
d. Verify that actual supply temperature changes to within 2% of the new setpoint	Y / N
B. Testing Results	PASS / FAIL
System passes criteria in 1c, 2c and 3d	<input type="checkbox"/> <input type="checkbox"/>

SUPPLY WATER TEMPERATURE RESET CONTROLS ACCEPTANCE

CEC-NRCA-MCH-09-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-09-F
Supply Water Temperature Control		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

C. Evaluation :
<input type="checkbox"/> PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"
Notes:

SUPPLY WATER TEMPERATURE RESET CONTROLS ACCEPTANCE

CEC-NRCA-MCH-09-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-09-F
Supply Water Temperature Control		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/CEPE/HERS/ATT certification identification (If applicable):
City/State/Zip:	Phone:

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/CEPE/HERS/ATT certification identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the applicable scope of system design, construction, or installation of features, materials, components, or manufactured devices specified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-10-A
Hydronic System Variable Flow Control Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
Intent:	Ensure that hydronic pump speed varies with building heating and cooling loads.

Construction Inspection
<ol style="list-style-type: none"> 1. Supporting documentation needed to perform test includes, but not limited to: <ol style="list-style-type: none"> a. As-built and/or Design Documents including Mechanical Equipment Schedules. b. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (<i>NA7.5.9 Hydronic System Variable Flow Control Acceptance At-A-Glance</i>). c. 2013 Building Energy Efficiency Standards. 2. Instrumentation to perform test includes, but not limited to: <ol style="list-style-type: none"> a. Calibrated differential pressure gauge (hydronic manometer) 3. Installation: <ul style="list-style-type: none"> <input type="checkbox"/> Pressure sensor location, setpoint, and reset control meets the requirements of 2013 Building Energy Efficiency Standards section 140.4(j) 6B. <input type="checkbox"/> For systems without direct digital control of individual coils reporting to the central control panel, differential pressure is measured at or near the most remote heat exchanger or the heat exchanger requiring the greatest differential pressure. <input type="checkbox"/> For systems with direct digital control of individual coils with central control panel, the static pressure set point is reset based on the valve requiring the most pressure, and the setpoint is no less than 80 percent open. <input type="checkbox"/> Exception taken. (Heating hot water system or Condenser water system serving only water-cooled chillers). 4. Document that all control pressure sensors are field calibrated (check one of the following): <ul style="list-style-type: none"> <input type="checkbox"/> Field calibrated by TAB contractor or other. <ul style="list-style-type: none"> <input type="checkbox"/> Calibration complete. All pressure sensors within 10% of calibrated reference sensor. (Provide supporting documentation). <input type="checkbox"/> Performed field calibration using calibrated differential pressure gauge (hydronic manometer). <ul style="list-style-type: none"> <input type="checkbox"/> Calibration complete. All pressure sensors within 10% of calibrated reference sensor. (Provide supporting documentation).

A. Functional Testing	Results
Step 1: Minimum / Low flow test	
a. Close coil control valves to achieve a maximum of 50% of design flow	<input type="checkbox"/>
b. Verify that the operating speed decreases (for systems with DDC to the zone level)	Y / N
c. Verify that the current operating speed has not increased (for all other systems that are not DDC)	Y / N
d. Record the system pressure as measured at the control sensor (<i>either ft. w.c. or psig</i>)	ft w.c.
<i>Note: 2.31 ft w.c. = 1.0 psig</i>	psig
e. Record the system pressure setpoint (<i>either ft. w.c. or psig</i>)	ft w.c.
	psig
f. Is the pressure reading on line 1.d. within 5% of pressure setpoint on line 1.e.?	Y / N
g. Did the system operation stabilize within 5 minutes after completion of step 1.a.?	Y / N
Notes:	

HYDRONIC SYSTEM VARIABLE FLOW CONTROL ACCEPTANCE

CEC-NRCA-MCH-10-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-10-A
Hydronic System Variable Flow Control Acceptance		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Step 2: Maximum/Design flow test	
a. Open control valves to achieve a minimum of 90% of design flow	<input type="checkbox"/>
b. Verify that the pump speed increases.	Y / N
c. Are the pumps operating at 100% speed?	Y / N
d. Record the system pressure as measured at the control sensor (<i>either ft. w.c. or psig</i>)	ft. w.c.
	psig
e. Record the system pressure setpoint (<i>either ft. w.c. or psig</i>)	ft. w.c.
	psig
f. Is the setpoint in 1.e. less than the setpoint in 2.e.?	Y / N
g. Is the pressure reading 2.d. within 5% of pressure setpoint 2.e.?	Y / N
h. Did the system operation stabilize within 5 minutes after completion of step 2.a.?	Y / N
Step 3: System returned to initial operating conditions	Y / N
Notes:	

B. Testing Results	PASS / FAIL	
Step 1: Select pass if Step 1b, 1f, and 1g are true (Y).	<input type="checkbox"/>	<input type="checkbox"/>
Step 2: Select pass if Steps 2b, 2c, 2f, 2g and 2h are true (Y).	<input type="checkbox"/>	<input type="checkbox"/>

C. Evaluation:	
<input type="checkbox"/>	PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"
Notes:	



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-10-A
Hydronic System Variable Flow Control Acceptance		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Acceptance is true and correct. 2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). 3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. 4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> 1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. 2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). 3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. 4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. 5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:



CERTIFICATE OF ACCEPTANCE

NRCA-MCH-11-A

Automatic Demand Shed Control Acceptance

(Page 1 of 2)

Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Intent:

Ensure that the central demand shed sequences have been properly programmed into the DDC system

Construction Inspection

- 1 Instrumentation to perform test includes, but not limited to:
 - a. None
- 2 Installation
 - ☐ The EMCS front end interface enables activation of the central demand shed controls

A. Functional Testing

Step 1: Engage the demand shed controls

- | | | |
|----|---|-------|
| a. | Engage the central demand shed control signal | Y / N |
| b. | Verify that the current operating temperature setpoint in a sample of non-critical spaces increases by the proper amount. | Y / N |
| c. | Verify that the current operating temperature setpoint in a sample of critical spaces does not change. | Y / N |

Step 2: Disengage the demand shed controls

- | | | |
|----|--|-------|
| a. | Disengage the central demand shed control signal | Y / N |
| b. | Verify that the current operating temperature setpoint in the sample of non-critical spaces returns to their original value. | Y / N |
| c. | Verify that the current operating temperature setpoint in the sample of critical spaces does not change. | Y / N |

Step 3: System returned to initial operating conditions

Y / N

B. Testing Results

PASS / FAIL

Test passes if all answers are yes in Step 1 and Step 2

☐

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c. Evaluation :

- ☐ PASS: All **Construction Inspection** responses are complete and all **Testing Results** responses are "Pass"

[illegible]

AUTOMATIC DEMAND SHED CONTROL ACCEPTANCE

CEC-NRCA-MCH-11-A (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-11-A
Automatic Demand Shed Control Acceptance		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
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Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

FAULT DETECTION AND DIAGNOSTICS FOR PACKAGED DIRECT EXPANSION UNITS

CEC-NRCA-MCH-12-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-12-F
Fault Detection and Diagnostics (FDD) for Packaged Direct Expansion Units		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>		Enforcement Agency Use: Checked by/Date

A. Functional Testing	Results
Step 1: Low Airflow Test	
a. Test low airflow condition by replacing the existing filter with a dirty filter or appropriate obstruction	
b. Verify that the fault detection and diagnostics system reports the fault	Y / N
c. Verify that the system is able to verify the correct refrigerant charge	Y / N
d. Verify that you are able to calibrate the following:	Y / N
<input type="checkbox"/> Outside Air Temp. Sensor <input type="checkbox"/> Return Air Temp. Sensors <input type="checkbox"/> Supply Air. Temp Sensors	
C Testing Results	PASS / FAIL
Test passes if all answers are yes under Eligibility Criteria and Functional Testing .	<input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"	

FAULT DETECTION AND DIAGNOSTICS FOR PACKAGED DIRECT EXPANSION UNITS

CEC-NRCA-MCH-12-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-12-F
Fault Detection and Diagnostics (FDD) for Packaged Direct Expansion Units		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/HERS/ATT Certification Identification (If applicable):
City/State/Zip:	Phone:

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
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Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

AUTOMATIC FAULT DETECTION AND DIAGNOSTICS FOR AIR HANDLING UNITS AND ZONE TERMINAL UNITS ACCEPTANCE

CEC-NRCA-MCH-13-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-13-F
Automatic Fault Detection and Diagnostics (FDD) for Air Handling Units and Zone Terminal Units Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
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Intent:	Verify that the system detects common faults in air handling units and zone terminal units.
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Construction Inspection	
<ol style="list-style-type: none"> 1 Instrumentation to perform test includes, but not limited to: <ol style="list-style-type: none"> a. No instrumentation is required – changes are implemented at the building automation system control station. 2 Installation <ol style="list-style-type: none"> a. The functional testing verifies proper installation of the controls for FDD for air handling units and zone terminal units. No additional installation checks are required. 	
A. Functional Testing for Air Handling Units	Results
Testing of each AHU with FDD controls shall include the following tests:	
Step 1: Sensor Drift/Failure	
a. Disconnect outside air temperature sensor from unit controller	Y / N
b. Verify that the FDD system reports a fault	Y / N
c. Connect OAT sensor to the unit controller	Y / N
d. Verify that FDD indicates normal system operation	Y / N
Step 2: Damper/Actuator Fault	
a. From the control system workstation, command the mixing box dampers to full open (100% outdoor air)	Y / N
b. Disconnect power to the actuator and verify that a fault is reported at the control workstation	Y / N
c. Reconnect power to the actuator and command the mixing box dampers to full open	Y / N
d. Verify that the control system does not report a fault	Y / N
e. From the control system workstation, command the mixing box dampers to a full-closed position (0% outdoor air)	Y / N
f. Disconnect power to the actuator and verify that a fault is reported at the control workstation	Y / N
g. Reconnect power to the actuator and command the dampers closed	Y / N
h. Verify that the control system does not report a fault during normal operation	Y / N
Step 3: Valve/actuator fault	
a. From the control system workstation, command the heating and cooling coil valves to full open or closed, then disconnect power to the actuator and verify that a fault is reported at the control workstation	Y / N
Step 4: Inappropriate simultaneous heating, mechanical cooling, and/or economizing	
a. From the control system workstation, override the heating coil valve and verify that a fault is reported at the control workstation	Y / N
b. From the control system workstation, override the cooling coil valve and verify that a fault is reported at the control workstation	Y / N
c. From the control system workstation, override the mixing box dampers and verify that a fault is reported at the control workstation	Y / N

AUTOMATIC FAULT DETECTION AND DIAGNOSTICS FOR AIR HANDLING UNITS AND ZONE TERMINAL UNITS ACCEPTANCE

CEC-NRCA-MCH-13-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-13-F
Automatic Fault Detection and Diagnostics (FDD) for Air Handling Units and Zone Terminal Units Acceptance		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. Functional Testing for Zone Terminal Units	Results
Testing shall be performed on one of each type of terminal unit (VAV box) in the project. A minimum of 5% of the terminal boxes shall be tested.	
Step 1: Sensor drift/failure	
a. Disconnect the tubing to the differential pressure sensor of the VAV box	Y / N
b. Verify that control system detects and reports the fault	Y / N
c. Reconnect the sensor and verify proper sensor operation	Y / N
d. Verify that the control system does not report a fault	Y / N
Step 2: Damper/actuator fault	
If the Damper is stuck open:	
a. Command the damper to be fully open (room temperature above setpoint)	Y / N
b. Disconnect the actuator to the damper	Y / N
c. Adjust the cooling setpoint so that the room temperature is below the cooling setpoint to command the damper to the minimum position. Verify that the control system reports a fault	Y / N
d. Reconnect the actuator and restore to normal operation	Y / N
If the Damper is stuck Closed:	
a. Set the damper to the minimum position	Y / N
b. Disconnect the actuator to the damper	Y / N
c. Set the cooling setpoint below the room temperature to simulate a call for cooling. Verify that the control system reports a fault	Y / N
d. Reconnect the actuator and restore to normal operation	Y / N
Step 3: Valve/actuator fault (For systems with hydronic reheat)	
a. Command the reheat coil valve to (full) open	Y / N
b. Disconnect power to the actuator. Set the heating setpoint temperature to be lower than the current space temperature, to command the valve closed. Verify that the fault is reported at the control workstation	Y / N
c. Reconnect the actuator and restore normal operation	Y / N
Step 4: Feedback loop tuning fault (unstable airflow)	
a. Set the integral coefficient of the box controller to a value 50 times the current value. Lower the space cooling setpoint to simulate a call for cooling.	
b. The damper cycles continuously and airflow is unstable. Verify that the control system detects and reports the fault	Y / N
c. Reset the integral coefficient of the controller to the original value to restore normal operation	Y / N
Step 5: Disconnected inlet duct	
a. From the control system workstation, command the damper to full closed, then disconnect power to the actuator and verify that a fault is reported at the control workstation	Y / N

AUTOMATIC FAULT DETECTION AND DIAGNOSTICS FOR AIR HANDLING UNITS AND ZONE TERMINAL UNITS ACCEPTANCE

CEC-NRCA-MCH-13-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-13-F
Automatic Fault Detection and Diagnostics (FDD) for Air Handling Units and Zone Terminal Units Acceptance		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

B. Testing Results	PASS / FAIL	
Test passes if all applicable answers are yes under Functional Testing Sections .	<input type="checkbox"/>	<input type="checkbox"/>
C. Evaluation :		
<input type="checkbox"/>	PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

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Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
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Field Technician Company Name:	Position with Company (Title):	
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Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

DISTRIBUTED ENERGY STORAGE DX AC SYSTEMS ACCEPTANCE

CEC-NRCA-MCH-14-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-14-F
Distributed Energy Storage DX AC Systems Acceptance		(Page 1 of 1)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>		Enforcement Agency Use: Checked by/Date

Intent:	<i>Verify proper operation of distributed energy storage DX systems.</i>
Construction Inspection	
1 Instrumentation to perform test includes, but not limited to: a. No special instrumentation is required to perform these tests. 2 Installation Prior to Performance Testing, verify and document the following: <input type="checkbox"/> The water tank is filled to the proper level <input type="checkbox"/> The water tank is sitting on a foundation with adequate structural strength <input type="checkbox"/> The water tank is insulated and the top cover is in place <input type="checkbox"/> The DES/DXAC is installed correctly (refrigerant piping, etc.) <input type="checkbox"/> Verify that the correct model number is installed and configured	
A. Functional Testing	
Step 1: Simulate no cooling load during a nighttime period by setting system time to between 9PM and 6AM. Raise the space temperature setpoint above the current space temperature. Verify and document the following:	
a. The system charges the tank.	Y / N
b. The system does not provide cooling to the building.	Y / N
Step 2: Simulate cooling load during daytime period (e.g. by setting time schedule to include actual time and placing thermostat cooling set-point below actual temperature). Verify and document the following:	
a. Supply fan operates continually during occupied hours.	Y / N
b. If the DES/DXAC has cooling capacity, DES/DXAC runs to meet the cooling demand (in ice melt mode)	Y / N / NA
c. If the DES/DXAC has no ice and there is a call for cooling, the DES/DXAC runs in direct cooling mode	Y / N / NA
Step 3: Simulate no cooling load during daytime condition. Verify and document the following:	
a. Supply fan operates as per the facility thermostat or control system	Y / N
b. The DES/DXAC and the condensing unit do not run	Y / N
Step 4: Simulate no cooling load during morning shoulder time period. Verify and document the following:	
a. The DES/DXAC is idle (the condensing unit and the refrigerant pumps remain off).	Y / N
Step 5: Simulate a cooling load during morning shoulder time period. Verify and document the following:	
a. The DES/DXAC runs in direct cooling mode (the compressor operates to cool the space).	Y / N
B. Calibrating Controls	
a. Verify that you are able to set the proper time and date, as per manufacturer's installation manual for approved installers	Y / N
C. Testing Results	
PASS / FAIL	
Test passes if all answers are yes under Functional Testing and Calibrating Controls .	<input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	

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Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:

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Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
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THERMAL ENERGY STORAGE (TES) SYSTEM ACCEPTANCE

CEC-NRCA-MCH-15-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-15-F
Thermal Energy Storage (TES) System Acceptance		
(Page 1 of 2)		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
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Intent:	Verify proper operation of distributed energy storage TES systems.
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Construction Inspection	
1.	Instrumentation to perform test includes, but not limited to:
a	No special instrumentation is required for the acceptance tests.

A. Certificate of Compliance Information				
<i>The following Certificate of Compliance information for both the chiller and the storage tank shall be provided on the plans to document the key TES System parameters and allow plan check comparison to the inputs used in the DOE-2 simulation. DOE-2 keywords are shown in ALL CAPITALS in parentheses.</i>				
a. Chiller	Brand and Model:			
	Type (Centrifugal, Reciprocating, etc):			
	Capacity (tons): (Size)			
	Starting Efficiency (kW/ton): (at beginning of ice production) (COMP-KW/TON-START)			
	Ending Efficiency (kW/ton): (at end of ice production) (COMP-KW/TON-END)			
	Capacity Reduction (% / F): (PER-COMP-REDUCT/F)			
b. Storage Tank	Storage Type (Check): (TES-TYPE)	<input type="checkbox"/> Chilled Water Storage	<input type="checkbox"/> Ice-on-Coil	<input type="checkbox"/> CHS
		<input type="checkbox"/> Ice Harvester	<input type="checkbox"/> Brine	
		<input type="checkbox"/> Ice-Slurry	<input type="checkbox"/> Eutectic Salt	
	Number of tanks (SIZE)			
	Storage Capacity per Tank (ton-hours)			
	Storage Rate (tons): (COOL-STORE-RATE)			
	Discharge Rate (tons): (COOL-SUPPLY-RATE)			
	Auxiliary Power (watts): (PUMP+AUX-KW)			
	Tank Area (sq ft): (CTANK-LOSS-COEFF)			
	Tank Insulation (R-Value): (CTANK-LOSS-COEFF)			

THERMAL ENERGY STORAGE (TES) SYSTEM ACCEPTANCE

CEC-NRCA-MCH-15-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-15-F
(Page 2 of 2)		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

B. Functional Testing	Results												
Step 1: TES System Design Verification													
<p>a. In the TES System Design Verification part, the installing contractor shall certify the following information, which verifies proper installation of the TES System consistent with system design expectations:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> <input type="checkbox"/> The TES system is one of the above eligible systems </td> <td style="width: 33%; vertical-align: top;"> <input type="checkbox"/> Initial discharge rate of the storage tanks (tons) </td> <td style="width: 33%; vertical-align: top;"> <input type="checkbox"/> Discharge test time (hrs). </td> </tr> <tr> <td style="vertical-align: top;"> <input type="checkbox"/> Initial charge rate of the storage tanks (tons) </td> <td style="vertical-align: top;"> <input type="checkbox"/> Final discharge rate of the storage tank (tons) </td> <td style="vertical-align: top;"> <input type="checkbox"/> Tank storage capacity after charge (ton-hrs) </td> </tr> <tr> <td style="vertical-align: top;"> <input type="checkbox"/> Final charge rate of the storage tank (tons) </td> <td style="vertical-align: top;"> <input type="checkbox"/> Charge test time (hrs) </td> <td style="vertical-align: top;"> <input type="checkbox"/> Tank storage capacity after discharge (ton-hrs) </td> </tr> <tr> <td style="vertical-align: top;"> <input type="checkbox"/> Tank standby storage losses (UA) </td> <td style="vertical-align: top;"> <input type="checkbox"/> Initial chiller efficiency (kW/ton) during charging </td> <td style="vertical-align: top;"> <input type="checkbox"/> Final chiller efficiency (kW/ton) during charging </td> </tr> </table>	<input type="checkbox"/> The TES system is one of the above eligible systems	<input type="checkbox"/> Initial discharge rate of the storage tanks (tons)	<input type="checkbox"/> Discharge test time (hrs).	<input type="checkbox"/> Initial charge rate of the storage tanks (tons)	<input type="checkbox"/> Final discharge rate of the storage tank (tons)	<input type="checkbox"/> Tank storage capacity after charge (ton-hrs)	<input type="checkbox"/> Final charge rate of the storage tank (tons)	<input type="checkbox"/> Charge test time (hrs)	<input type="checkbox"/> Tank storage capacity after discharge (ton-hrs)	<input type="checkbox"/> Tank standby storage losses (UA)	<input type="checkbox"/> Initial chiller efficiency (kW/ton) during charging	<input type="checkbox"/> Final chiller efficiency (kW/ton) during charging	Y / N
<input type="checkbox"/> The TES system is one of the above eligible systems	<input type="checkbox"/> Initial discharge rate of the storage tanks (tons)	<input type="checkbox"/> Discharge test time (hrs).											
<input type="checkbox"/> Initial charge rate of the storage tanks (tons)	<input type="checkbox"/> Final discharge rate of the storage tank (tons)	<input type="checkbox"/> Tank storage capacity after charge (ton-hrs)											
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<input type="checkbox"/> Tank standby storage losses (UA)	<input type="checkbox"/> Initial chiller efficiency (kW/ton) during charging	<input type="checkbox"/> Final chiller efficiency (kW/ton) during charging											
Step 2: TES System Controls and Operation Verification													
a. The TES system and the chilled water plant is controlled and monitored by an EMS.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail												
b. Force the time between 9:00 p.m. and 9:00 a.m. and simulate a partial or no charge of the tank and simulate no cooling load by setting the indoor temperature setpoint higher than the ambient temperature. Verify that the TES system starts charging (storing energy).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail												
c. Force the time to be between 6:00 p.m. and 9:00 p.m. and simulate a partial charge on the tank and simulate a cooling load by setting the indoor temperature set point lower than the ambient temperature. Verify that the TES system starts discharging.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail												
d. Force the time to be between noon and 6:00 p.m. and simulate a cooling load by lowering the indoor air temperature set point below the ambient temperature. Verify that the tank starts discharging and the compressor is off. For systems designed to meet partial loads the system should be run until the TES storage is fully depleted. The number of hours of operation must meet or exceed the designed operational hours for the system.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail												
e. Force the time to be between 9:00 a.m. to noon, and simulate a cooling load by lowering the indoor air temperature set point below the ambient temperature. Verify that the tank does not discharge and the cooling load is met by the compressor only.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail												
f. Force the time to be between 9:00 p.m. and 9:00 a.m. and simulate a full tank charge by changing the output of the sensor to the EMS. Verify that the tank charging is stopped.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail												
g. Force the time to be between noon and 6:00 p.m. and simulate no cooling load by setting the indoor temperature set point above the ambient temperature. Verify that the tank does not discharge and the compressor is off.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail												
C. Evaluation (check one):													
<input type="checkbox"/> PASS: Construction Inspection responses are complete and all tests in step 2 pass.													

CERTIFICATE OF ACCEPTANCE – USER INSTRUCTIONS	NRCA-MCH-15-A
Thermal Energy Storage (TES) System Acceptance	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

**Supply Air Temperature Reset Controls Acceptance**

CEC-NRCA-MCH-16-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE		NRCA-MCH-16-F
Supply Air Temperature Reset Controls Acceptance		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
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Intent:	<i>Verify that the supply air temperature modulates to meet system temperature setpoint(s).</i>
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Construction Inspection									
<p>1. Supporting documentation needed to perform test may include, but is not limited to:</p> <ul style="list-style-type: none"> a. As-built and/or Design Documents, including Mechanical Equipment Schedules and control schedules. b. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (<i>NA7.5.15 Supply Air Temperature Reset Controls Acceptance At-A-Glance</i>). c. 2013 Building Energy Efficiency Standards Nonresidential Appendix (Section NA7). 									
<p>2. Instrumentation to perform test includes, but is not limited to:</p> <ul style="list-style-type: none"> a. Hand-held temperature sensor Date of calibration: _____ (<i>must be within one year</i>) 									
<p>3. Installation:</p> <p>Check the appropriate box:</p> <p><input type="checkbox"/> The supply air temperature reset controls are installed per the requirements of the 2013 Building Energy Efficiency Standards section 140.4(f): Multi-zone systems shall include controls that automatically reset supply-air temperatures:</p> <ul style="list-style-type: none"> (1) In response to representative building loads or to outdoor air temperature; and (2) By at least 25 percent of the difference between the design supply-air temperature and the design room air temperature. <p><input type="checkbox"/> An exception is taken to this requirement (one of the following must be true; acceptance test is not needed):</p> <p>Zones served by space-conditioning systems in which at least 75 percent of the energy for reheating, or providing warm air in mixing systems, is provided from a site-recovered or site-solar energy source.</p> <p>Where supply-air temperature reset would increase overall building energy use.</p> <p>Zones in which specific humidity levels are required to satisfy exempt process loads. Computer rooms or spaces with only IT equipment are not exempt process loads.</p> <p>Zones with a peak supply air quantity of 300 cfm or less.</p> <p>The system has controls to prevent reheat, recool, and simultaneous cooling and heating.</p>									
<p>4. Document that all system air temperature sensors are factory or field calibrated or perform field check (check a or b):</p> <table border="1"> <tr> <td>a.</td> <td>Factory calibrated, or Field-calibrated by TAB technician, commissioning agent, or other.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Calibration complete, all sensors within 2% of calibrated reference sensor (provide supporting documentation, e.g. a copy of TAB calibration results).</td> </tr> <tr> <td>b.</td> <td>I have performed a field check using a calibrated temperature standard (i.e. device that has been calibrated within the last 12 months).</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Check complete, all air temperature sensors within 2% of calibrated reference sensor (provide supporting documentation, including results from system air sensors and calibrated reference standard).</td> </tr> </table>		a.	Factory calibrated, or Field-calibrated by TAB technician, commissioning agent, or other.	<input type="checkbox"/>	Calibration complete, all sensors within 2% of calibrated reference sensor (provide supporting documentation, e.g. a copy of TAB calibration results).	b.	I have performed a field check using a calibrated temperature standard (i.e. device that has been calibrated within the last 12 months).	<input type="checkbox"/>	Check complete, all air temperature sensors within 2% of calibrated reference sensor (provide supporting documentation, including results from system air sensors and calibrated reference standard).
a.	Factory calibrated, or Field-calibrated by TAB technician, commissioning agent, or other.								
<input type="checkbox"/>	Calibration complete, all sensors within 2% of calibrated reference sensor (provide supporting documentation, e.g. a copy of TAB calibration results).								
b.	I have performed a field check using a calibrated temperature standard (i.e. device that has been calibrated within the last 12 months).								
<input type="checkbox"/>	Check complete, all air temperature sensors within 2% of calibrated reference sensor (provide supporting documentation, including results from system air sensors and calibrated reference standard).								
<p>5. Document current supply air temperature: _____ °F</p>									
Notes:									

**Supply Air Temperature Reset Controls Acceptance**

CEC-NRCA-MCH-16-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE		NRCA-MCH-16-F
Supply Air Temperature Reset Controls Acceptance		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. Functional Testing	
Check to make sure that chilled / hot water coils, if used, are not already fully open and calling for maximum cooling / heating. If this is the case, reverse Steps 1 and 2 and/or change the set point range as necessary to conduct this test.	
Reset control parameter is (circle one): Outside air temperature, Zone or return air temperature, Zones calling for heating or cooling, or Other _____.	
Step 1: During occupied mode, adjust the reset control parameter to decrease the supply air temperature (to the lower supply temperature limit).	
a. Supply air temperature controls modulate as intended.	Y / N
b. Actual supply air temperature decreases to meet the new set point within +/- 2°F.	Y / N
c. Supply air temperature stabilizes within 15 minutes.	Y / N
Supply air temperature set point: _____ ° F Actual supply air temperature: _____ ° F	
Step 2: During occupied mode, adjust the reset control parameter to increase the supply air temperature (to the upper supply temperature limit).	
a. Supply air temperature controls modulate as intended.	Y / N
b. Actual supply air temperature increases to meet the new set point within +/- 2°F.	Y / N
c. Supply air temperature stabilizes within 15 minutes.	Y / N
Supply air temperature set point: _____ ° F Actual supply air temperature: _____ ° F	
Step 3: Restore reset control parameter to automatic control.	
a. Supply air temperature controls modulate as intended.	Y / N
b. Actual supply air temperature changes to meet the new set point within +/- 2°F.	Y / N
c. Supply air temperature stabilizes within 15 minutes.	Y / N
Supply air temperature set point: _____ ° F Actual supply air temperature: _____ ° F	
B. Evaluation :	
<input checked="" type="checkbox"/>	PASS: All Construction Inspection responses are complete and Functional Testing Results are all circled YES .
Notes:	

CERTIFICATE OF ACCEPTANCE – USER INSTRUCTIONS	NRCA-MCH-16-A
Supply Air Temperature Reset Controls Acceptance	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/CEPE/HERS/ATT certification identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
1. The information provided on this Certificate of Acceptance is true and correct.		
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).		
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.		
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/CEPE/HERS/ATT certification identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.		
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the applicable scope of system design, construction, or installation of features, materials, components, or manufactured devices specified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).		
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.		
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.		
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CONDENSER WATER SUPPLY TEMPERATURE RESET CONTROLS ACCEPTANCE

CEC-NRCA-MCH-17-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-17-F
Condenser Water Supply Temperature Reset Controls Acceptance		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Intent:	<i>Ensure that the condenser water supply temperature is automatically reset as indicated in the control sequence(s).</i>
----------------	--

Construction Inspection					
<p>1. Supporting documentation needed to perform test may include, but is not limited to:</p> <ul style="list-style-type: none"> a. As-built and/or Design Documents, including Mechanical Equipment Schedules and control schedules. b. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (NA7.5.65 <i>Condenser Water Supply Temperature Reset Controls Acceptance At-A-Glance</i>). c. Building Energy Efficiency Standards Nonresidential Appendix (Section NA7). 					
<p>2. Instrumentation to perform test includes, but is not limited to:</p> <ul style="list-style-type: none"> a. Hand-held temperature sensor _____ <i>Date of calibration (must be within 1 year)</i> b. Hand-held relative humidity or wet-bulb temperature sensor / psychrometer _____ <i>Date of calibration (must be within 1 year)</i> 					
<p>3. Installation Verification:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check if the condenser water supply system and control system are installed per the system design, as documented on the building plans or as-builts. <input type="checkbox"/> Check if condenser water supply temperature control sequence, including condenser water supply high and low limits, are available and documented in the building documents. <input type="checkbox"/> Check if all cooling tower fan motors are operational, and cooling tower fan speed controls (e.g. VSDs) are installed, operational, and connected to cooling tower fan motors per OEM start-up manuals and sequence of operation. <input type="checkbox"/> Check if cooling tower fan control sequence, including tower design wetbulb temperature and approach, are available and documented in the building documents. <input type="checkbox"/> Check if the following temperature sensors are installed per plans: outdoor air drybulb and wetbulb, entering condenser water, and leaving chilled water. Note any discrepancies: 					
<p>4. Document that all system temperature and relative humidity sensors are factory or field calibrated or perform field check (check one of the following):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Sensors are calibrated by others. Factory calibrated, or Field-calibrated by TAB technician, commissioning agent, or other. Calibration complete, all sensors within 2% of calibrated reference sensor (provide supporting documentation, i.e. a copy of TAB calibration results). <input type="checkbox"/> I have performed a field check using a calibrated temperature standard (i.e. device that has been calibrated within the last 12 months). Check complete, all sensors within 2% of calibrated reference sensor (provide supporting documentation, including results from system sensors and calibrated reference standard). 					
<p>5. From the control system, or using temperature sensors, document the following:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Outdoor air drybulb temperature _____ ° F</td> <td style="width: 50%;">Outdoor air wetbulb temperature _____ ° F</td> </tr> <tr> <td>Entering condenser water temperature _____ ° F</td> <td>Leaving chilled water temperature _____ ° F</td> </tr> </table>		Outdoor air drybulb temperature _____ ° F	Outdoor air wetbulb temperature _____ ° F	Entering condenser water temperature _____ ° F	Leaving chilled water temperature _____ ° F
Outdoor air drybulb temperature _____ ° F	Outdoor air wetbulb temperature _____ ° F				
Entering condenser water temperature _____ ° F	Leaving chilled water temperature _____ ° F				

CONDENSER WATER SUPPLY TEMPERATURE RESET CONTROLS ACCEPTANCE

CEC-NRCA-MCH-17-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-17-F
Condenser Water Supply Temperature Reset Controls Acceptance		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. Functional Testing

The system cooling load must be sufficiently high to run the test. If necessary, artificially increase the cooling / evaporator load to perform the functional tests. If necessary, reverse Steps 1 & 2 in the test based on atmospheric conditions and building loads.

EXEMPTION: If the control sequence differs significantly from that implied by the tests, and / or has already been tested during the building commissioning process, attach a description of the control sequence, a description of the tests that were done to verify the system operates according to the sequence, the test results, and a plot of any associated trend data.

Reset control parameter is (circle one): Outside air wet-bulb temperature, Load signal from chiller, Condenser water & chilled water temperatures, or Other _____.

Step 1: Adjust the reset control parameter to decrease the condenser water temperature (toward the lower supply temperature limit).

a. Condenser water temperature controls modulate as intended.	Y / N
b. Actual condenser water supply temperature decreases to meet new set point within + / - 2°F.	Y / N
c. Cooling tower fan(s) stage properly and/or adjust speed accordingly to meet lower set point.	Y / N
d. Chiller load amps decrease.	Y / N

Step 2: Adjust the reset control parameter to increase the condenser water temperature (toward the upper supply temperature limit).

a. Condenser water temperature controls modulate as intended.	Y / N
b. Actual condenser water supply temperature increases to meet new set point within + / - 2°F.	Y / N
c. Cooling tower fan(s) stage properly and/or adjust speed accordingly to meet upper set point.	Y / N
d. Chiller load amps increase.	Y / N

Step 3: Restore reset control parameter to automatic control.

a. Condenser water temperature controls modulate as intended.	Y / N
b. Actual condenser water supply temperature changes to meet new set point within + / - 2°F.	Y / N
c. Cooling tower fan(s) stage properly and/or adjust speed accordingly to meet set point.	Y / N

B. Evaluation:

?	PASS: All Construction Inspection responses are complete and Functional Testing Results are all circled YES .
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Notes:

CERTIFICATE OF ACCEPTANCE - USER INSTRUCTIONS	NRCA-MCH-17-A
Condenser Water Supply Temperature Reset Controls Acceptance	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
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<ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

ENERGY MANAGEMENT CONTROL SYSTEM ACCEPTANCE

CEC-NRCA-MCH-18-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-18-F
Energy Management Control System Acceptance		(Page 1 of 1)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.		<i>Enforcement Agency Use: Checked by/Date:</i>

Intent:	<i>The purpose of this acceptance test is to help ensure the central control system, when installed, is properly installed and configured and capable of meeting the applicable requirements of Title 24 Part 6. The EMCS is a complex, highly customized control system with many opportunities for installation and programming problems. Obviously it is important to identify, diagnose, and resolve these problems. This acceptance test can help assist with this effort.</i>
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A. Construction Inspection
Prior to functional testing and conducting other acceptance tests that rely on the EMCS: <ul style="list-style-type: none"> <input type="checkbox"/> Factory start-up and check-out completed <input type="checkbox"/> Point-to-point verification completed <input type="checkbox"/> I/O point lists available <input type="checkbox"/> Sequence of operations of each system are programmed <input type="checkbox"/> Written sequences are available <input type="checkbox"/> Input sensors are calibrated

B. Functional Testing	Results
Conduct the following verification checks to validate the functionality of the EMCS: <ol style="list-style-type: none"> 1. Verify the control graphics represent the system configuration 2. Verify control points are properly mapped to the graphics screen 3. Raise and lower a sampling of space temperature setpoints in the software and verify the system responds appropriately 4. Verify the time-of-day start-up and shut-down function initiates a proper system response 5. Verify trending capabilities by establishing trend logs for a sampling of control points 6. Verify alarm conditions are monitored 7. Verify the EMCS panel is installed on an emergency power circuit or has adequate battery back-up 	Y / N Y / N Y / N Y / N Y / N Y / N Y / N

C. Testing Results	PASS / FAIL	
Test passes if all Construction Inspection boxes are checked and all Functional Testing results are 'Y'	?	?

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

COMPRESSED AIR SYSTEM ACCEPTANCE

CEC-NRCA-PRC-01-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-01-F
Compressed Air System Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date:
---	--

Intent:	Verify that compressed air system controls are installed and operating correctly.
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Construction Inspection
<ol style="list-style-type: none"> 1. Supporting documentation needed to perform test includes: <ol style="list-style-type: none"> a. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (<i>NA7.13 Compressed Air Systems Acceptance At-A-Glance</i>). b. 2013 Building Energy Efficiency Standards (<i>Section 120.6(e)</i>). 2. Instrumentation to perform test may include, but is not limited to: <ol style="list-style-type: none"> a. Power meter(s) for every compressor b. Pressure transducer(s) for every compressor c. Flow meter(s) for every compressor 3. Installation: (all of the following boxes must be checked) <div style="margin-left: 20px;"> <input type="checkbox"/> Equipment installation is complete (including compressors, storage, controls, conditioning equipment, piping, etc.) <input type="checkbox"/> Compressed air system is ready for system operation, including completion of all start-up procedures per manufacturer's recommendations. </div> 4. Prior to functional testing, fill out the System Specifications Table. If the number of compressors exceeds the number in this list, please list additional compressors and specifications in the Notes section. 5. Prior to functional testing, document below the method and tools for observing and recording the states of each compressor in the system, as seen in Step 3 of Functional Testing.

Method for Observing and Recording Compressor States:

System Specifications Table								
Total Online System Capacity (acfm):					Operating Pressure (psi):			
Compressor Specifications:								
Compressor	Size (hp)	Rated Capacity (acfm)	Control Type (check one or fill-in for 'Other')					Acting as Trim Compressor?
			<i>Fixed Speed</i>	<i>Variable Displacement</i>	<i>Variable Speed</i>	<i>Centrifugal</i>	<i>Other</i>	
1								Y / N
2								Y / N
3								Y / N
4								Y / N
5								Y / N
6								Y / N
7								Y / N
8								Y / N
9								Y / N
10								Y / N

If number of compressors exceeds 10, please list the additional compressors with specifications in the following Notes section.
Notes:

COMPRESSED AIR SYSTEM ACCEPTANCE

CEC-NRCA-PRC-01-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-01-F
Compressed Air System Acceptance		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. Functional Testing	Results
Step 1: Verify that the methods from the Construction Inspection have been employed by confirming the following:	
a. Compressor states can be observed and recorded for every compressor.	Y / N
b. The current air demand (in acfm) can be measured or inferred.	Y / N
Step 2: Run the compressed air supply system steadily at a load within (or close to) the expected operational load range as can be practically implemented for a duration of at least 10 minutes. Verify the following:	
a. System is running steadily for at least 10 minutes.	Y / N
b. System is running within (or close to) the expected operational load range.	Y / N
c. Downstream equipment is not affected by test valve being open (if applicable).	Y / N / NA

Step 3: Observe and record the operating states of each compressor and the current air demand during the test.							
					Current Air Demand (acfm)		
	Compressor States (Check one)				Compressor States (Check all that apply)		
Compressor	Off	Unloaded	Partially Loaded	Fully Loaded	Blowoff	Short Cycling	Notes:
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

If number of compressors exceeds 10, please list the additional compressors with specifications in the Notes section.

Step 4: Confirm that the system exhibits the following behavior following the test:	
a. No compressor exhibits short-cycling (loading and unloading more often than once per minute).	Y / N
b. No compressor exhibits blowoff (venting compressed air at the compressor itself).	Y / N
c. The trim compressors shall be the only compressors partially loaded, while the base compressors will either be fully loaded or off by the end of the test. (only applicable for new systems)	Y / N / NA
Step 5: Return system to initial operating conditions.	Y / N

B. Testing Results	PASS / FAIL
Step 1: Verify construction inspection steps are complete (all answers are Y).	
Step 2: Run system steadily at operational load range for 10 minutes (all answers are Y or NA).	
Step 3: Record all observed states of the compressors and system demand (Table is filled out).	
Step 4: System exhibits expected behavior (all answers are Y or NA).	

COMPRESSED AIR SYSTEM ACCEPTANCE

CEC-NRCA-PRC-01-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-01-F
Compressed Air System Acceptance		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

C. Evaluation:
<input checked="" type="checkbox"/> PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"
Notes:

CERTIFICATE OF ACCEPTANCE – USER INSTRUCTIONS	NRCA-PRC-01-A
Compressed Air System Acceptance	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
<ul style="list-style-type: none"> I certify that this Certificate of Acceptance documentation is accurate and complete. 		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

COMMERCIAL KITCHEN EXHAUST SYSTEM ACCEPTANCE

CEC-NRCA-PRC-02-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-02-F
Commercial Kitchen Exhaust System Acceptance		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
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Intent: Verify that airside economizers function properly
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Construction Inspection	
1. Supporting documentation needed to perform test includes: <ul style="list-style-type: none"> a. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (<i>NA7.5.4 Air Economizer Controls Acceptance At-A-Glance</i>). b. 2013 Building Energy Efficiency Standards. 	
2. Instrumentation to perform test includes: <ul style="list-style-type: none"> a. Space differential pressure sensor Calibration Date: _____ (must be within last year) b. Recording Analog Manometer with Pitot Tube and VelGrid Calibration Date: _____ (must be within last year) 	
3. Installation: (all of the following boxes should be checked) <ul style="list-style-type: none"> <input type="checkbox"/> Exhaust and make-up air systems and installed and fully functional. <input type="checkbox"/> Demand Ventilation Control systems (if installed) are fully functional and have been set up and calibrated by the installing contractor <input type="checkbox"/> For Kitchens with >5,000 cfm of Type I and Type II kitchen hood exhaust, All Type I hoods meet the requirements of Table 140.9-A 	
A. Functional Testing	Results
The following acceptance test applies to systems with and without demand control ventilation exhaust systems. These tests shall be conducted at full load conditions for each hood.	
Step 1: Setup:	
a. Operate all sources of outdoor air providing replacement air for the hoods	Y / N
b. Operate all sources of recirculated air providing conditioning for the space in which the hoods are located	Y / N
c. Operate all appliances under the hoods at operating temperatures	Y / N
Step 2: Verify the following:	
a. Verify that the thermal plume and smoke is completely captured and contained within each hood at full load conditions by observing smoke or steam produced by actual cooking operation and/or by visually seeding the thermal plume using devices such as smoke candles or smoke puffers. Smoke bombs shall not be used (note: smoke bombs typically create a large volume of effluent from a point source and do not necessarily confirm whether the cooking effluent is being captured). For some appliances (e.g., broilers, griddles, fryers), actual cooking at the normal production rate is a reliable method of generating smoke). Other appliances that typically generate hot moist air without smoke (e.g., ovens, steamers) need seeding of the thermal plume with artificial smoke to verify capture and containment.	Y / N
b. Verify that space pressurization is appropriate (e.g. kitchen is slightly negative relative to adjacent spaces and all doors open/close properly).	Y / N
c. Verify that each Type 1 hood has an exhaust rate that is at or below the maximum allowed.	Y / N / NA
Step 3: Make adjustments as necessary until full capture and containment and adequate space pressurization are achieved and maximum allowable exhaust rates are not exceeded. Adjustments may include: adjust exhaust hood airflow rates; Add hood side panels; Add rear seal (back plate); Increase hood overhang by pushing hood back; and Relocate supply outlets to improve the	

COMMERCIAL KITCHEN EXHAUST SYSTEM ACCEPTANCE

CEC-NRCA-PRC-02-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-02-F
Commercial Kitchen Exhaust System Acceptance		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

capture and containment performance	
Step 4: Measure and record the final airflow for each Type I hood.	Y / N / NA

The following additional acceptance test shall be performed on all exhaust hoods with demand control ventilation exhaust systems.	
Step 5: Turn off all kitchen hoods, makeup air and transfer systems	
Step 6: Turn on one of the appliances on the line and bring to operating temperature. Confirm that::	
a. DCV system automatically switches from off to the minimum flow setpoint.	Y / N
b. The minimum flow setpoint does not exceed the larger of: 50% of the design flow, or; the ventilation rate required per Section 120.1.	Y / N
c. The makeup air and transfer air system flow rates modulate as appropriate to match the exhaust rate	Y / N
d. Appropriate space pressurization is maintained.	Y / N
Step 7:	
Press the timed override button. Confirm that system ramps to full speed and back to minimum speed after override times out.	Y / N
Step 8: Operate all appliances at typical conditions. Apply sample cooking products and/or utilize smoke puffers as appropriate to simulate full load conditions. Confirm that:	
a. DCV system automatically ramps to full speed.	Y / N
b. Hood maintains full capture and containment during ramping to and at full-speed.	Y / N
c. Appropriate space pressurization is maintained.	Y / N
B. Testing Results	PASS / FAIL
Step 2: Smoke was fully captured?	
Step 4: All Type I hoods are drawing exhaust at less than or equal to the values in Table 140.9-A.	
Step 6: DCV and MUA system respond (all Yes).	
Step 7: Timed override works	
Step 8: DCV and MUA systems respond to full load conditions (all Yes)	

C. Evaluation :
<input type="checkbox"/> PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"

Notes:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

- I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
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Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

ENCLOSED PARKING GARAGE EXHAUST SYSTEM ACCEPTANCE

CEC-NRCA-PRC-03-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-03-F
Enclosed Parking Garage Exhaust System Acceptance		
(Page 1 of 2)		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Intent: Verify that airside economizers function properly

Construction Inspection	
1. Supporting documentation needed to perform test includes: <ul style="list-style-type: none"> a. 2013 Building Energy Efficiency Standards Nonresidential Compliance Manual (<i>NA7.5.4 Air Economizer Controls Acceptance At-A-Glance</i>). b. 2013 Building Energy Efficiency Standards. 	
2. Instrumentation to perform test includes: <ul style="list-style-type: none"> a. Space differential pressure sensor Calibration Date: _____ (must be within last year) 	
3. Installation: (all of the following boxes should be checked) <ul style="list-style-type: none"> <input type="checkbox"/> Each CO sensor has a valid factory calibration certificate (+/-5%) <input type="checkbox"/> CO sensors are located in areas of high CO concentration per 120.6(c) <input type="checkbox"/> CO control setpoint is at or below 25ppm for all sensors per 120.6(c) 	
A. Functional Testing	Results
Step 1: During a time of low activity (e.g. after hours or mid-morning or mid-afternoon) verify the following:	
a. All sensors active and reading a setpoint of <25ppm	Y / N
b. Exhaust fans are running at minimum speed.	Y / N
c. Exhaust fans are drawing <30 rated power.	Y / N / NA
Step 2: Apply CO span gas with a concentration of 30 ppm, and a concentration accuracy of +/- 2%, one by one to 50% of the sensors but no more than 10 sensors per garage and to at least one sensor per proximity zone. For each sensor tested observe	
a. All sensors active and reading a setpoint of between 25 and 35ppm	Y / N
b. Exhaust fans are running at maximum speed.	Y / N
c. Exhaust fans go back to minimum speed when span gas is removed.	Y / N / NA
Step 3: Temporarily override the programmed sensor calibration/replacement period to 5 minutes.	
a. Wait 5 minutes and observe that fans ramp to full speed and an EMCS alarm is set	Y / N
Step 4: Temporarily place the system in unoccupied mode and override the programmed unoccupied sensor alarm differential from 30% for 4 hours to 1% for 5 minutes.	
a. Wait 5 minutes and observe that fans ramp to full speed and an alarm is received by the facility operators. Restore programming.	Y / N
Step 5: Temporarily override the programmed occupied sensor proximity zone alarm differential from 30% for 4 hours to 1% for 5 minutes.	
a. Wait 5 minutes and observe that fans ramp to full speed and an alarm is received by the facility operators. Restore programming.	Y / N
B. Testing Results	PASS / FAIL
Steps 1-5: All responses were yes	

ENCLOSED PARKING GARAGE EXHAUST SYSTEM ACCEPTANCE

CEC-NRCA-PRC-03-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-03-F
Enclosed Parking Garage Exhaust System Acceptance (Page 2 of 2)		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

C. Evaluation :
<input type="checkbox"/> PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"

Notes:

Documentation Author's Declaration Statement

- I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/HERS/ATT Certification Identification (If applicable):
City/State/Zip:	Phone:

FIELD TECHNICIAN'S DECLARATION STATEMENT

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4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:
Field Technician Company Name:	Position with Company (Title):
Address:	CEA/HERS/ATT Certification Identification (If applicable):
City/State/Zip:	Phone: Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:
Responsible Acceptance Person Company Name:	Position with Company (Title):
Address:	CSLB License:
City/State/Zip:	Phone: Date Signed:



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-04-F
Refrigerated Warehouse Evaporator & Evaporator Fan		(Page 1 of 2)
Motor Controls Acceptance		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: This test required for all newly installed evaporators. Submit one Certificate of Acceptance for each evaporator that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Intent:	<i>Verify that the evaporator fans are controlled to modulate their speed in response to space temperature. For control strategies that utilize relative humidity for control, the design engineer should be consulted for designing an appropriate test method.</i>
----------------	--

Construction Inspection

A. Installation. Verify the following:

- ☐ All refrigerated space temperature sensors used for control are verified to be mounted in a location away from direct evaporator discharge air draft.
- ☐ All fans motors are operational and rotating in the correct direction.
- ☐ Fan speed control is operational and connected to evaporator fan motors.
- ☐ All speed controls are in "auto" mode.

B. Field Calibration:

Sensors used for control must be calibrated to read accurate from the control system. Calibration values must be documented. Attached field calibration records to this form. The following sensors are used for air-cooled condenser control:

- Refrigerated space temperature sensors used for control

The calibrating instrument used to calibrate the sensors used for control must have the following accuracy:

- ☐ Temperature: $\pm 0.7^{\circ}\text{F}$ between -30°F and 200°F

Notes:

A. Functional Testing	Results
Record the zone temperature setpoint:	$^{\circ}\text{F}$
Step 1: Disable any conflicting controls (such as defrost override) if currently active. Measure current space temperature from the operators interface. Program this temperature as the test temperature setpoint into the control system for the functional test steps. Allow 5 minutes for system to normalize.	
Step 2: Lower the test temperature setpoint in 1 degree increments.	
a. Evaporator fan controls modulate to increase fan motor speed?	Y / N
b. Evaporator fan motor speed increases in response to controls?	Y / N
Step 3: Raise the test temperature setpoint in 1 degree increments until fans go to minimum speed.	
a. Evaporator fan controls modulate to decrease fan motor speed?	Y / N
b. Evaporator fan motor speed decreases in response to controls?	Y / N
c. Record the minimum fan motor control speed. Enter, with units, as rpm, Hertz, or percent of full speed.	
Step 4: Restore control system to original zone space setpoint and restore controls disabled in Step #1.	Y / N

B. Testing Results	PASS / FAIL	
Step 2: Evaporator fans increase speed when actual space temperature is higher than the test setpoint (plus any deadband).		
Step 3: Evaporator fans decrease speed when actual space temperature is lower than the space setpoint (plus any deadband).		

C. Evaluation:	
<input checked="" type="checkbox"/>	PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"
Notes:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

- I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	

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Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

REFRIGERATED WAREHOUSE EVAPORATIVE CONDENSER CONTROLS ACCEPTANCE

CEC-NRCA-PRC-05-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-05-F
Refrigerated Warehouse Evaporative Condenser Controls		(Page 1 of 3)
Acceptance		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Intent:

Verify that the evaporative condenser has ambient wetbulb following control and fan motor variable speed control

Construction Inspection

1. Installation. Verify the following:

- ☐ All condenser fan motors are operational and rotating in the correct direction.
- ☐ All condenser fan speed controls are operational and connected to condenser fan motors to operate in unison the fans serving a common condenser loop.
- ☐ Temperature sensor used by the controller is mounted in a location that is not exposed to direct sunlight.
- ☐ Receiver pressurization valves, such as the outlet pressure regulator (OPR), (if used) are set lower than the drain leg pressure regulator valve setting.
- ☐ Drain leg pressure regulator valves (if used) are set below the minimum condensing temperature/pressure setpoint.

2. Control System. Verify the following:

- ☐ Saturated condensing temperature input is the temperature equivalent reading of the condenser pressure sensor.
- ☐ Drybulb and relative humidity sensor readings are correctly converted to wetbulb temperature.
- ☐ Minimum condensing temperature control setpoint is at 70°F or lower.
- ☐ All speed controls are in "auto" mode.

3. Field Calibration:

Sensors used for control must be calibrated to read accurate from the control system. Calibration values must be documented. Attached field calibration records to this form. The following sensors are used for evaporative condenser control:

- ☐ Condenser inlet and outlet pressure sensor
- ☐ Ambient dry bulb temperature sensor
- ☐ Relative humidity sensor

The calibrating instruments used to calibrate the sensors used for control must have the following accuracies:

- ☐ Pressure: ± 2.5 psi between 0 and 500 psig
- ☐ Temperature: $\pm 0.7^\circ\text{F}$ between -30°F and 200°F
- ☐ Relative humidity: $\pm 1\%$ between 5% and 90% RH

Notes:

REFRIGERATED WAREHOUSE EVAPORATIVE CONDENSER CONTROLS ACCEPTANCE

CEC-NRCA-PRC-05-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-05-F
Refrigerated Warehouse Evaporative Condenser Controls		(Page 2 of 3)
Acceptance		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. Functional Testing	Results
The system cooling load must be sufficiently high to run the test, i.e. with a condensing temperature above the minimum SCT setpoint. The loads can often be increased somewhat as required to perform the Functional Testing.	
Step 1: Override any conflicting controls before performing functional tests.	
Notes:	
Step 2: Document the current operating conditions and the current setpoints.	
a. Current ambient wetbulb temperature (WBT) <i>Note: If WBT is not available in the controls system, document the drybulb temperature (DBT) and relative humidity (RH). Calculate the current wetbulb temperature based on those values.</i>	°F
b. Current saturated condensing temperature (SCT) or condensing pressure	°F psig
c. Calculate the actual condenser temperature difference (Actual TD) [SCT – WBT]	°F
d. Current SCT or pressure control setpoint	°F psig
e. Current condenser control temperature difference (Control TD)	°F
Notes:	
Step 3: Update the Control TD setpoint to the Actual TD obtained in Step 2. This will be referred to as the “test setpoint.” Allow 5 minutes for condenser fan speed to normalize.	
Step 4: Raise the test setpoint in 1°F increments until the condenser fan control modulates to minimum fan motor speed.	
a. Fan motor speed decreases.	Y / N
b. All condenser fan motors serving common condenser loop decrease speed in unison in response to controller output; observed at the control system and at the condenser(s).	Y / N
c. Record the minimum fan speed. Enter with units as rpm, Hertz, or percent of full speed.	
Notes:	
Step 5: Lower the test setpoint in 1°F increments until the condenser fan control modulates to increase fan motor speed.	
a. Fan motor speed increases.	Y / N
b. All condenser fan motors serving common condenser loop increase speed in unison in response to controller output; observed at the control system and at the condenser(s).	Y / N
Notes:	
Step 6: Verify the override minimum SCT setpoint.	
a. Current minimum SCT setpoint	°F
Using the control system, change the minimum condensing temperature setpoint to a value greater than the current operating condensing temperature.	
b. Condenser fan controls modulate to decrease capacity.	Y / N
c. All condenser fans serving common condenser loop modulate in unison.	Y / N
d. Condenser fan controls stabilize within a 5 minute period.	Y / N
Notes:	

REFRIGERATED WAREHOUSE EVAPORATIVE CONDENSER CONTROLS ACCEPTANCE

CEC-NRCA-PRC-05-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-05-F
Refrigerated Warehouse Evaporative Condenser Controls		(Page 3 of 3)
Acceptance		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Step 7: Restore the Control TD and the minimum SCT setpoint to the values recorded Step #2e and #6a.		Y / N
Step 8: Restore any controls disabled in Step #1.		Y / N / NA

B. Testing Results	PASS / FAIL	
Step 4: All condenser fan motors serving a common condenser loop decrease speed in unison in response to a higher condenser control TD setpoint. (Pass if all Answers are Yes)		
Step 5: All condenser fan motors serving a common condenser loop increase speed in unison in response to a lower condenser control TD setpoint. (Pass if all Answers are Yes)		
Step 6: The control system overrides the variable setpoint with a minimum SCT setpoint. The override minimum SCT setpoint is 70°F or lower. (Pass if all Answers are Yes)		

C. Evaluation:	
<input type="checkbox"/>	PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"
Notes:	

CERTIFICATE OF ACCEPTANCE	NRCA-PRC-05-A
Evaporative Condenser Controls Acceptance	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
<ul style="list-style-type: none"> I certify that this Certificate of Acceptance documentation is accurate and complete. 		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

REFRIGERATED WAREHOUSE AIR COOLED CONDENSER CONTROLS ACCEPTANCE

CEC-NRCA-PRC-06-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-06-F
Refrigerated Warehouse Air Cooled Condenser Controls Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
---	---

Intent:	Verify that the air-cooled condenser has ambient drybulb following control and fan motor variable speed control
----------------	---

Construction Inspection
<p>1. Installation. Verify the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> All condenser fan motors are operational and rotating in the correct direction. <input type="checkbox"/> All condenser fan speed controls are operational and connected to condenser fan motors to operate in unison the fans serving a common condenser loop. <input type="checkbox"/> Temperature sensor used by the controller is mounted in a location that is not exposed to direct sunlight. <input type="checkbox"/> Receiver pressurization valves, such as the outlet pressure regulator (OPR), (if used) are set lower than the drain leg pressure regulator valve setting. <input type="checkbox"/> Drain leg pressure regulator valves (if used) are set below the minimum condensing temperature/pressure setpoint. <p>2. Control System. Verify the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Saturated condensing temperature input is the temperature equivalent reading of the condenser pressure sensor. <input type="checkbox"/> Minimum condensing temperature control setpoint is at 70°F or lower. <input type="checkbox"/> All speed controls are in "auto" mode. <p>3. Field Calibration:</p> <p>Sensors used for control must be calibrated to read accurate from the control system. Calibration values must be documented. Attached field calibration records to this form. The following sensors are used for air-cooled condenser control:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Condenser inlet and outlet pressure sensors <input type="checkbox"/> Ambient drybulb temperature sensor <p>The calibrating instruments used to calibrate the sensors used for control must have the following accuracies:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pressure: ±2.5 psi between 0 and 500 psig <input type="checkbox"/> Temperature: ±0.7°F between -30°F and 200°F
Notes:

A. Functional Testing	Results
The system cooling load must be sufficiently high to run the test, i.e. with a condensing temperature above the minimum SCT setpoint. The loads can often be increased somewhat as required to perform the Functional Testing.	
Step 1: Override any conflicting controls before performing functional tests.	
Notes:	
Step 2: Document the current operating conditions and current setpoints.	
a. Current ambient drybulb temperature (DBT)	°F
b. Current saturated condensing temperature (SCT) or condensing pressure	°F psig

REFRIGERATED WAREHOUSE AIR COOLED CONDENSER CONTROLS ACCEPTANCE

CEC-NRCA-PRC-06-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-06-F
Refrigerated Warehouse Air Cooled Condenser Controls Acceptance		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

c. Calculate the actual condenser temperature difference (Actual TD) [SCT – DBT]	°F
d. Current SCT or pressure control setpoint	°F psig
e. Current condenser control temperature difference (Control TD)	°F
Notes:	
Step 3: Set the Control TD setpoint to the Actual TD obtained in Step 2. This will be referred to as the “test setpoint.” Allow 5 minutes for condenser fan speed to normalize.	
Step 4: Using the control system, raise the test setpoint in 1°F increments until the condenser fan control modulates to minimum fan motor speed.	
a. Fan motor speed decrease.	Y / N
b. All condenser fan motors serving common condenser loop decrease speed in unison in response to controller output; observed at the control system and at the condenser(s).	Y / N
c. Record the minimum fan motor control speed. Enter with units as rpm, Hertz, or percent of full speed.	
Notes:	
Step 5: Using the control system, lower the test setpoint in 1°F increments until the condenser fan control modulates to increase fan motor speed.	
a. Fan motor speed increases.	Y / N
b. All condenser fan motors serving common condenser loop increase speed in unison in response to controller output; observed at the control system and at the condenser(s).	Y / N
Notes:	
Step 6: Verify override minimum SCT setpoint.	
a. Record the current minimum condensing temperature setpoint.	°F
Using the control system, change the minimum SCT setpoint to a value greater than the current operating SCT.	
b. Condenser fan controls modulate to decrease capacity.	Y / N
c. All condenser fans serving common condenser loop modulate in unison.	Y / N
d. Condenser fan controls stabilize within a 5 minute period.	Y / N
Notes:	
Step 7: Restore the Control TD and the minimum SCT setpoint to the values recorded Step #2e and #6a.	Y / N
Step 8: Restore any controls disabled in Step #1.	Y / N / NA

B. Testing Results	PASS / FAIL	
Step 4: All condenser fan motors serving a common condenser loop decrease speed in unison in response to a higher condenser control TD setpoint. (Pass if all Answers are Yes)		
Step 5: All condenser fan motors serving a common condenser loop increase speed in unison in response to a lower condenser control TD setpoint. (Pass if all Answers are Yes)		
Step 6: The control system overrides the variable setpoint with a minimum SCT setpoint. This override minimum SCT setpoint is 70°F or lower. (Pass if all Answers are Yes)		

REFRIGERATED WAREHOUSE AIR COOLED CONDENSER CONTROLS ACCEPTANCE

CEC-NRCA-PRC-06-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-06-F
Refrigerated Warehouse Air Cooled Condenser Controls Acceptance		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

C. Evaluation:	
<input type="checkbox"/>	PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"
Notes:	

CERTIFICATE OF ACCEPTANCE – USER INSTRUCTIONS	NRCA-PRC-06-A
Air Cooled Condenser Controls Acceptance	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
<ul style="list-style-type: none"> I certify that this Certificate of Acceptance documentation is accurate and complete. 		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

REFRIGERATED WAREHOUSE VARIABLE SPEED COMPRESSOR ACCEPTANCE

CEC-NRCA-PRC-07-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-07-F
Refrigerated Warehouse Variable Speed Compressor		(Page 1 of 2)
Acceptance		
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: Submit one Certificate of Acceptance for each compressor that must demonstrate compliance.

Enforcement Agency Use: Checked by/Date

Intent:

Verify that applicable compressors control compressor speed in response to the refrigeration load.

Construction Inspection

A. Installation. Verify the following:

- ☐ All single open-drive screw compressors dedicated to a suction group have variable speed control.
- ☐ All compressor speed controls are operational and connected to compressor motors.
- ☐ Compressor nameplate data is correctly entered into the PLC or other control system.
- ☐ Compressor panel control readings for RPM, % speed, kW, and amps match the readings from the PLC or other control systems.
- ☐ All sensor readings used by the compressor controller convert or calculate to the correct conversion units at the controller (e.g., pressure reading is correctly converted to appropriate saturated temperature, etc.)
- ☐ All speed controls are in "auto" mode.

B. Field Calibration:

Sensors used for control must be calibrated to read accurate from the control system. Calibration values must be documented. Attached field calibration records, including offsets used, to this form. The following sensors are used for air-cooled condenser control:

- ☐ Compressor suction pressure sensor

The calibrating instrument used to calibrate the sensor used for control must have the following accuracies:

- ☐ Pressure: ± 2.5 psi between 0 and 500 psig

Notes:

A. Functional Testing	Results
<i>The system cooling load must be sufficiently high to run the test. Artificially increase or decrease evaporator loads (add or shut off zone loads, change setpoints, etc.) as may be required to perform the Functional Testing.</i>	
Step 1: Override any conflicting controls before performing the Functional Tests.	
Notes:	
Step 2: Document current suction operation and setpoints	
a. Current operating suction pressure or saturated suction temperature (SST)	psig
	°F
Step 3: Set the test suction setpoint.	
a. Document the current suction pressure or SST setpoint	psig
	°F
Program into the control system a target setpoint equal to the current operating condition measured in Step #2. Allow 5	

NRCA-PRC-07-F

(Page 2 of 2)

Zip Code:

Y / N

June 2013

CERTIFICATE OF ACCEPTANCE – USER INSTRUCTIONS	NRCA-PRC-07-A
Variable Speed Compressor Acceptance	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
<ul style="list-style-type: none"> I certify that this Certificate of Acceptance documentation is accurate and complete. 		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

REFRIGERATED WAREHOUSE ELECTRIC RESISTANCE UNDERSLAB HEATING SYSTEM

CEC-NRCA-PRC-08-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-08-F
Refrigerated Warehouse Electric Resistance Underslab Heating System Acceptance		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
---	---

Intent:
Verify that the electric resistance under floor heating system is thermostatically controlled and automatically is disabled during the summer on-peak period defined by the local electric utility.

Construction Inspection
1 Instrumentation to perform test includes, but not limited to: <ul style="list-style-type: none"> • A clamp on amp meter
2 Installation <ul style="list-style-type: none"> <input type="checkbox"/> Summer on-peak period is programmed into all electric resistance underfloor heating system controls.
Notes:

A. Functional Testing	Results
Record the current underfloor temperature setpoint.	°F
Step 1: Using the control system, lower the underfloor temperature setpoint.	
a. Does the underfloor electric resistance heater turn OFF?	Y / N
Step 2: Using the control system, raise the underfloor temperature setpoint.	
a. Does the underfloor electric resistance heater turn ON?	Y / N
Step 3: Using the control system, change the control system's date and time corresponding to the local utility's summer on-peak period. If control system only accounts for time, set system time corresponding to the local utility's summer on-peak period.	
a. Does the underfloor electric resistance heater turn OFF?	Y / N
Step 4: Restore system to correct date and time, and control setpoints.	Y / N

B. Testing Results	PASS / FAIL	
Step 1: The underfloor electric resistance heater turned OFF when the underfloor temperature is higher than the setpoint. (Pass if Answer is Yes)		
Step 2: The underfloor electric resistance heater turned ON when the underfloor temperature is lower than the setpoint. (Pass if Answer is Yes)		
Step 3: The underfloor electric resistance heater turned OFF during the simulated peak demand period. (Pass if Answer is Yes)		

C. Evaluation:	
<input type="checkbox"/>	PASS: All Construction Inspection responses are complete and all Testing Results responses are "Pass"
Notes:	

REFRIGERATED WAREHOUSE ELECTRIC RESISTANCE UNDERSLAB HEATING SYSTEM

CEC-NRCA-PRC-08-F (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-PRC-08-F
Refrigerated Warehouse Electric Resistance Underslab Heating System Acceptance		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

CERTIFICATE OF ACCEPTANCE – USER INSTRUCTIONS	NRCA-PRC-08-A
Electric Resistance Underslab Heating System Acceptance	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
<ul style="list-style-type: none"> I certify that this Certificate of Acceptance documentation is accurate and complete. 		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
FIELD TECHNICIAN'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building. 		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	CEA/HERS/ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person). The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

DESIGN REVIEW KICKOFF

CEC-NRCC-CXR-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE – DATA FIELD DEFINITIONS AND CALCULATIONS	NRCC-CXR-01-E
Design Review Kickoff	(Page 1 of 1)
Project Name:	Date Prepared:

A. General Information	
Climate Zone:	Building Type: Conditioned Area (sf):
Reviewer's Name:	Reviewer's Agency:
Enforcement Agency:	Permit Number:
Enforcement Agency Use: Checked by	Enforcement Agency Use: Date
DATE OF DESIGN REVIEW KICKOFF	
____/____/____	
DESIGN REVIEW CHECKLISTS PROVIDED TO DESIGN TEAM	
YES <input type="checkbox"/> NO <input type="checkbox"/>	
DESIGN REVIEWER QUALIFICATIONS:	
<input type="checkbox"/> <10,000 ft ² : design engineer	
<input type="checkbox"/> >10,000 ft ² and <50,000ft ² : in-house engineer not associated with project or third-party design engineer	
<input type="checkbox"/> >50,000 ft ² or complex mechanical system: third-party design engineer	
LIST OF MEETING ATTENDEES:	
<input type="checkbox"/> Owner: _____ <input type="checkbox"/> Design Reviewer: _____	
<input type="checkbox"/> Project Manager: _____ <input type="checkbox"/> Design Engineer(s): _____	
DOCUMENTS RECEIVED BY DESIGN REVIEWER FOR DESIGN REVIEW KICKOFF:	
<input type="checkbox"/> Owner's Project Requirements <input type="checkbox"/> Basis of Design or Narrative	
<input type="checkbox"/> Drawing Set (issue & date): _____	
<input type="checkbox"/> Specifications: _____ <input type="checkbox"/> Other: _____	
DESIGN REVIEW MEETING TOPICS:	

PROJECT SCOPE:
DESIGN ELEMENTS AND ASSUMPTIONS:
HVAC SYSTEM SELECTION:
RECOMMENDED ENERGY EFFICIENCY MEASURES:
OTHER COMMENTS:
COORDINATION:
TARGET CONSTRUCTION DOCUMENT REVIEW DATE:
TARGET PERMIT SUBMITTAL DATE:

CERTIFICATE OF COMPLIANCE – DATA FIELD DEFINITIONS AND CALCULATIONS	NRCC-CXR-01-E
Design Review Kickoff	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

COMMISSIONING – CONSTRUCTION DOCUMENTS

CEC-NRCC-CXR-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-CXR-02-E
Commissioning - Construction Documents		(Page 1 of 7)
Project Name:	Date Prepared:	

General Information		
Climate Zone:	Building Type:	Conditioned Area (sf):
Reviewer's Name:	Reviewer's Agency:	
<i>Note: Design Review for each system/subsystem must be submitted</i>		
Enforcement Agency:	Permit Number:	
Enforcement Agency Use: Checked by	Enforcement Agency Use: Date	

Code Section	Measure	Design Reviewer			Designer Response		
		Yes. Complies	Does Not Comply	Consider Better Practice	Complies	Will Include in Next Draft	Not Included - State Reason
ENVELOPE							
JOINTS AND OTHER OPENINGS							
110.7	Plans indicate that joints, penetrations and other openings in the building envelope shall be sealed to limit infiltration and exfiltration.			N/A			
120.7	Roof/ceiling, wall and floor and soffit insulation must meet requirements identified in this section.			N/A			
INSULATION AND ROOFING PRODUCTS							
140.3(a)1.A	Roofing products for low-sloped roofs meet minimum solar reflectance of 0.63 and minimum thermal emittance of 0.75 OR minimum Solar Reflectance Index of 75. Steep-sloped roofs meet requirements of 0.20 and 0.75 OR 16, respectively.			N/A			
140.3(a)1.A-B	Exterior roofs, ceilings, and exterior walls, floors and soffits must have an overall assembly U-factor no greater than the applicable value in TABLE 140.3-B, C or D.			N/A			
NOTES							
LIGHTING							
LIGHTING CONTROLS							
130.1(a)	Accessible, independent switching or a control device is included for all areas enclosed by ceiling height partitions.			N/A			
130.1(a)4	General lighting is controlled separately from all other lighting systems.			N/A			

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130.1(b)	General lighting of enclosed spaces 100 sf or larger with a lighting load that exceeds 0.5 W/sf, have multi level lighting controls from at least one of the following methods: manual dimming, lumen maintenance, tuning, automatic daylighting controls, demand responsive lighting controls. Control steps are in accordance with Table 130.1-A.			N/A			
130.1(c)	Shut off controls are controlled with occupant sensing controls, automatic time-switch control, signal from another building system or other control and are shown for all indoor lighting systems.			N/A			
130.1(c)5	Offices 250 square feet or smaller; multipurpose rooms of less than 1000 square feet, and classrooms and conference rooms of any size, shall be equipped with occupant sensor(s) to shut off the lighting.			N/A			
130.1(c)6	Lighting in corridors and stairwells shall be controlled by occupant sensing controls that separately reduce lighting power in each space by at least 50% when the area is unoccupied.			N/A			
130.1(e)	For buildings greater than 10,000 sf, demand response controls should be included to reduce total building lighting power by a minimum of 15%.			N/A			

DAYLIGHT AREA

140.3(c)	Daylight areas required for conditioned or unconditioned spaces greater than 5,000 ft ² of roof area and with ceiling height greater than 15 feet are shown on building plans and meet requirements of this section.			N/A			
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DAYLIGHT CONTROLS

130.1(d)2	All skylit daylit zones, primary sidelit daylit zones and secondary sidelit daylit zone are shown on plans. Controls of skylit and sidelit zones are independent and provide multi-level lighting in accordance with Table 130.1-A. Plans should indicate that general lighting power is reduced by a minimum of 65% when daylit illuminance is 150% of design illuminance.			N/A			
Best Practice	<i>The locations of all photo sensors are shown on the plans. Height and position criteria are also shown. Photo sensors are not installed in direct sunlight nor in direct light of lighting fixtures.</i>						
Best Practice	<i>Specification defines the amount of light to be gathered by the photo sensor in relation to its location for the lighted surface and this matches the application. For example: if 5 FC on the horizontal floor is the maintained lighting level and the sensor is mounted 15 feet off the ground, the sensor must be capable of detecting 5 FC from floor at that distance.</i>						
Best Practice	<i>Daylight dimming zones have consistent window/glazing types and orientation (e.g., a single zone should not include east and south facing glass or have a section of tall window-wall and another wall section of smaller windows).</i>						
Best Practice	<i>Specifications state that sensor and dimming settings are set up and calibrated after furniture and final finishes and all lighting equipment are installed and operational.</i>						

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Best Practice	A complete step by step sequence of operation is included defining the lighting levels (max and min), zones, interaction with occupants, interaction with occupancy and time-clock controls, and interaction with lighting on-off or dimming switches.						
Best Practice	Interface with BAS or other lighting control systems is defined and is fully compatible for all features of the sequence required. Interface shown on lighting and controls drawings.						
Best Practice	Daylight dimming controls are properly integrated with emergency fixtures, using separate ballasts for dimming and emergency backup.						
Best Practice	Daylight zones that penetrate more than one row of fixtures from the windows have the fixtures closer to the windows receiving a lower light command to create a more even lighting and save energy.						
Best Practice	The ballast specified is able to turn down as low as the specified daylight dimming system.						
Best Practice	To save energy, dimming specifications require that the illumination during night time shall be adjusted to be 20% or more lower than the daytime target, since the apparent illumination at night will appear higher.						

OUTDOOR LIGHTING CONTROLS AND EQUIPMENT

130.2(a)	Outdoor incandescent lighting rated over 100 watts is controlled by a motion sensor.			N/A			
130.2(c)1	All outdoor lighting is controlled by photocontrol or outdoor astronomical time-switch control.			N/A			
130.2(c)3	Outdoor lighting where bottom of luminaire is mounted 24 feet or less above the ground is controlled by motion sensors or other controls that are capable of reducing the lighting power of each luminaire by 40 to 80% in response to the area being vacated.			N/A			
130.2(c)4	Automatic lighting controls shown on plans for building façade, ornamental hardscape or outdoor dining lighting includes part-night lighting control, motion sensor control, or time-based control.			N/A			

NOTES

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SERVICE HOT WATER HEATING

110.3(c)2	SHW systems with circulating pumps or with electrical heat trace have automatic controls that turn off the system during unoccupied periods.			N/A			
120.3	Pipe insulation for space conditioning and service water-heating with fluid temperatures listed in Table 120.3-A have insulation levels as specified in subsection (a) and (b).			N/A			

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NOTES**HVAC DESIGN - ALL BUILDINGS****HVAC EQUIPMENT**

110.2(a)	Equipment meets efficiency requirements of Tables 110.2-A through 110.2-K.						
120.2(i)	All air-cooled, unitary, DX units (packaged, split-system, heat pumps and VRF) with economizers are equipped with Fault Detection and Diagnostics systems.						
120.3	Pipe insulation for space conditioning and service water-heating with fluid temperatures listed in Table 120.3-A have insulation levels as specified in subsection (a) and (b).						
140.4(a)	Mechanical heating and cooling equipment are the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building, as calculated according to the requirements of Section 140.4(b).						
140.4(c)4	HVAC motors for fans that are less than 1 hp and 1/12 hp or greater are ECM or have a minimum motor efficiency of 70%. Motors also have means to adjust motor speed for balancing or remote control.						
140.4(g)	Electric resistance heating systems are not provided for space heating for cases where exceptions are not allowed.						
Best Practice	<i>In drier climates and when large outdoor air fractions are required, evaporative pre-cooling packages were evaluated to pre-cool outside air and cool the air flowing over the DX condensing unit.</i>						
Best Practice	<i>In semi-arid climates, two-stage evaporative cooling has been evaluated in lieu of mechanical refrigeration.</i>						

HVAC ZONING

Best Practice	<i>Zone each air handler to serve only areas with common loads to allow more aggressive control strategies and improve comfort. Have different AHU's serving core vs. perimeter areas.</i>						
Best Practice	<i>The design accommodates partial occupancy energy savings when the owner's requirements or narrative describe any possibility of partial occupancy, by zoning air handlers by floor or by part of a floor, or by incorporating controlled floor dampers, or VAV air terminals going totally shut when not occupied, etc.</i>						

CONTROLS

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120.2(a) and (b)	Each zone is controlled by an individual thermostatic control. Controls are capable of setting temperatures to 55°F for heating and 85°F for cooling and provide a temperature deadband of at least 5°F if controlling both heating and cooling.						
120.2(e)	Each space conditioning system is equipped with controls to shut the system off during periods of nonuse and will temporarily operate the system to maintain setback and setup temperatures while keeping ventilation dampers closed.						
120.2(e)3	Systems serving multipurpose rooms less than 100 sf and classrooms, conference, auditorium or meeting center rooms greater than 750 sf have occupancy sensors that interface with HVAC controls to automatically setup the cooling setpoint by 2F or more and setback the heating setpoint by 2F or more and automatically reset the minimum required ventilation rate. These occupant sensor ventilation control devices must meet the requirements of section 120.1(c)5.						
120.2(f)	Outdoor air supply and exhaust equipment shall be installed with dampers that automatically close upon fan shutdown.						
120.2(g)	Each space-conditioning system serving multiple zones with a combined conditioned floor area of more than 25,000 square feet shall be designed, installed, and controlled to serve isolation areas.						
120.2(h)	HVAC systems with DDC to the Zone level shall be programmed to allow centralized demand shed for non-critical zones.						
140.4(d)	Zone controls prevent reheating, recooling and simultaneous provisions of heating and cooling to the same zone.						
Best Practice	<i>Each wall mounted thermostat is located away from potential sources that would adversely affect the reading (close to copiers, direct sunlight, below or above a supply air diffuser or convector, etc.). Any thermostats mounted on exterior walls are installed in sealed and insulated junction boxes.</i>						
Best Practice	<i>Corner office should always have their own thermostats, air terminal boxes or fin-tube radiators.</i>						
Best Practice	<i>Multiple air terminal boxes in a single large open space are served by a single thermostat, or multiple thermostat signals are polled and altered, to prevent fighting of terminals and simultaneous heating and cooling.</i>						
Best Practice	<i>Control sequences are listed for equipment operated by stand-alone packaged controls. Unoccupied sequences should be included.</i>						
Best Practice	<i>Control sequences exist for each piece of equipment listed in the equipment schedule that is monitored or controlled by the building automation system (BAS). Unoccupied sequences should be included.</i>						
Best Practice	<i>Outside air temperature sensors should be in a commercially designed solar shield located on a north wall or some other location out of direct sunlight and away from building exhaust or heat rejection equipment.</i>						

VENTILATION RATES

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120.1(a)2	The outdoor air-ventilation rate and air-distribution assumptions made in the design of the ventilating system are clearly identified on the plans.						
120.1(b)	Each space is designed to have natural ventilation OR mechanical ventilation that is no less than the larger of conditioned floor area times the requirements in Table 120.1-A or 15 cfm times the expected number of occupants.						
Best Practice	<i>The minimum and maximum outdoor air rates for each air handler are listed on the equipment schedules.</i>						
Best Practice	<i>The outdoor air-ventilation rates are based on planned owner occupancy as defined in owner's design intent and are not based on maximum egress occupancy rates.</i>						
Best Practice	<i>Heat recovery is specified on fan systems where the design outside air flow rate is greater than 70% and design supply air flow rate is greater than 5,000 cfm.</i>						

DEMAND CONTROL VENTILATION (DCV)

120.1(c)3-4	HVAC systems that have an economizer, serve a space with a design occupant density greater than or equal to 25 people per 1000 sf, and are either a single zone system with any controls or multiple zone system with DDC controls to the zone level must have demand control ventilation controls. The following must be met: A. CO2 sensors installed in each room served by systems with DCV controls B. CO2 sensors are located between 3 ft and 6 ft above the floor C. CO2 concentrations maintained at less than or equal to 600 ppm plus outdoor ppm D. During hours of expected occupancy, controls maintain the system ventilation rate.			N/A			
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ALL HVAC SYSTEMS - ECONOMIZERS

140.4(e)1 and 3	Each cooling fan system that has a design mechanical cooling capacity over 54,000 Btu/h has an air economizer or a water economizer. Air economizers must comply with the high limit shutoff controls shown in Table 140.4-B.						
140.4(e)2.B	Plans indicate integrated economizer controls are set up such that partial cooling is provided by the economizer even when additional mechanical cooling is required.						
Best Practice	<i>Economizer dampers are specified to be driven by direct drive actuators rather than rod linkages, which can be a major cause of economizer malfunction.</i>						
Best Practice	<i>Barometric relief is used, if possible. If not, relief fans (rather than return fans) are used in most cases.</i>						
Best Practice	<i>Outdoor and return air sensors are properly selected, properly located to provide accurate and repeatable measurements for controlling economizer operation. Averaging sensors cover the entire duct or coil face areas.</i>						

DUCT DESIGN

120.4(a)	All air distribution system ducts and plenums must be installed, sealed and insulated as required by 120.4(a).						
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140.4(l)	Plans indicate duct sealing leakage rates.						
Best Practice	<i>Ducts utilize low static pressure design. Identify the most restrictive branch from the fan to the last air terminal unit. Identify possible means of significantly reducing the pressure drop. Branch duct systems are designed for equal pressure drop, when possible.</i>						
Best Practice	<i>Duct branches with significantly differing static pressure requirements have volume control strategically placed to aid in TAB work.</i>						
Best Practice	<i>Fans discharge into duct sections that remain straight for as long as possible (ideally 10 duct diameters) to reduce fan inefficiencies from system effects.</i>						
Best Practice	<i>Duct velocities are generally below 2,000 fpm for ducts in ceiling plenums, 1500 fpm for exposed ducts and 3500 fpm in mechanical rooms and non-noise sensitive shafts.</i>						
Best Practice	<i>Duct friction rates are generally less than 0.25" WC per 100 lineal feet nearer the fan, 0.15 to 0.20" in the main ducts and 0.08 to 0.12" WC /100' nearer the end of the system. Designs over these rates should be questioned. Very energy efficient design can lower these values by up to 40%.</i>						
Best Practice	<i>Ensure that drawings are sufficiently detailed to ensure that distribution system design intent is adequately conveyed. If sufficient detail is not included in drawings, installations may result in significantly higher pressure drops and hence higher energy consumption and other operating issues.</i>						

ACCEPTANCE AND COMMISSIONING

120.5(a)	Acceptance requirements clearly identified in construction documents.			N/A			
120.8(e)	Commissioning measures or requirements are reflected in the construction documents.			N/A			
120.8(g)	Requirements for functional performance tests are reflected in the construction documents.			N/A			

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:



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Project Name:	Date Prepared:	

General Information		
Climate Zone:	Building Type:	Conditioned Area (sf):
Reviewer's Name:	Reviewer's Agency:	
<i>Note: Design Review for each system/subsystem must be submitted</i>		
Enforcement Agency:	Permit Number:	
Enforcement Agency Use: Checked by	Enforcement Agency Use: Date	

Code Section	Measure	Design Reviewer			Designer Response		
		Yes. Complies	Does Not Comply	Consider Better Practice	Complies	Will Include in Next Draft	Not Included - State Reason
SIMPLE HVAC SYSTEMS							
DESIGN - FAN SYSTEMS							
120.1(e)	Measured outdoor air rates of constant volume mechanical ventilation and space-conditioning systems shall be within 10% of required outside air rate.						
140.4(c)1	Fan power index at design conditions meets the following: 0.8 watts per cfm supply air for constant volume fan systems with total horsepower over 25 hp						
Best Practices	Fans appear to be correctly sized for application, accounting for a factor of safety, diversity and redundancy issues.						
CONTROLS							
110.2(c)	Controls for unitary single zone, air conditioners, heat pumps and furnaces must have a setback thermostat.						
140.4(m)	Cooling systems identified in Table 140.4-D have fan controls to vary the indoor fan airflow as a function of load: 1. DX and chilled water cooling systems that control capacity based on occupied space temperature have a minimum of 2 stages of control with no more than 66% speed operating at stage 1 and draw no more than 40% of fan power at full fan speed when operating at 66% speed. 2. Systems that control space temperature by modulating airflow to the space have proportional fan control such that at 50% air flow the power draw is no more than 30% of fan power at full fan speed. 3. Systems with air side economizer have a minimum of 2 speeds of fan control during economizer operation.						
NOTES							

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

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2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

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General Information		
Climate Zone:	Building Type:	Conditioned Area (sf):
Reviewer's Name:	Reviewer's Agency:	
<i>Note: Design Review for each system/subsystem must be submitted</i>		
Enforcement Agency:	Permit Number:	
Enforcement Agency Use: Checked by	Enforcement Agency Use: Date	

Code Section	Measure	Design Reviewer			Designer Response		
		Yes. Complies	Does Not Comply	Consider Better Practice	Complies	Will Include in Next Draft	Not Included - State Reason
COMPLEX MECHANICAL SYSTEMS							
FAN SYSTEMS							
120.1(e)	All variable volume mechanical ventilation and space-conditioning systems shall include dynamic controls to maintain measured outside air rates within 10% of required rate at both full and reduced supply airflow conditions.						
140.4(c) 2.B	SP sensors for VAV fans shall be placed such that the controller set point is no greater than 1/3 the total design fan static pressure, except for systems with zone reset control.						
140.4(c) 2.C	VAV Systems with DDC of individual zone boxes reporting to the central control panel, static pressure set point shall be reset based on the zone requiring the most pressure.						
140.4 (m)	Cooling systems identified in Table 140.4-D have fan controls to vary the indoor fan airflow as a function of load: 1. DX and chilled water cooling systems that control capacity based on occupied space temperature have a minimum of 2 stages of control. 2. Systems that control space temperature by modulating airflow to the space have proportional fan control. 3. Systems with air side economizer have a minimum of 2 speeds of fan control during economizer operation.						
Best Practice	Fan cabinet enclosure and internal components are selected to minimize pressure drop, e.g. face velocity is less than 500 fpm, low pressure drop coils, filters, etc.						
Best Practice	Fan wheel is selected for efficient operation, e.g. larger diameter rotating at lower speed.						

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SUPPLY AIR TEMPERATURE (SAT) RESET

140.4(f)	Systems that serve multiple zones have controls that automatically reset supply air temperature. Zones with high internal loads with near constant airflow are designed for the elevated reset supply air temperature. Reset controls are in response to building loads or to outdoor air temperature and are at least 25% of the difference between supply air and design room air temperature. Control sequences are identified on plans.						
<i>Best Practice</i>	SAT reset is established with an aggressive reset schedule of 10F, e.g. 55F during warm weather and 65F during cool weather.						
<i>Best Practice</i>	<i>SAT reset off terminal box damper position or thermostat demand does not rely on a lone worst zone, but averaged over a few zones with greatest demand.</i>						

HEAT REJECTION EQUIPMENT

110.2(e)	Open and closed circuit cooling towers have conductivity or flow-based controls and are equipped with a Flow Meter, Overflow Alarm and Efficient Drift Eliminators.						
140.4(h) 2	Tower fans powered by motors greater than 7.5 hp have controls that automatically change fan speed to control the leaving fluid temperature or condensing temperature or pressure of the heat rejection device.						
140.4(h) 3	Open cooling towers with multiple condenser water pumps are designed so that all cells can run in parallel with the larger of A) flow this is produced by the smallest pump or B) 50% of the design flow for the cell.						
140.4(h) 5	Multiple cell heat rejection equipment with variable speed fan drives shall operate the maximum number of fans and control all operating fans to the same speed.						
<i>Best Practice</i>	<i>A higher condenser water delta-T design is used or was considered. The cooling tower is oversized, accordingly.</i>						
<i>Best Practice</i>	<i>For the cooling tower bypass, a 2-way valve should be used in the bypass line rather than a 3-way valve, in order to reduce the pressure drop. The 2-way valve is sized so that no water will go over the tower when in full bypass.</i>						
<i>Best Practice</i>	<i>For DX air handlers with water-cooled condensers, the entering condenser water temperature is reset based on outdoor wet bulb or surrogate conditions.</i>						
<i>Best Practice</i>	<i>When cool weather cooling loads cannot be met by 100% outside air economizing, a plate and frame heat exchanger is used in parallel with the chiller to chill the water directly from the cooling tower water.</i>						
<i>Best Practice</i>	<i>Cooling towers are specified with low flow accommodating weir dams in the top basin and tower staging sequences call for as much tower(s) to be open to flow as possible within tower limits to take advantage of heat exchange surface area.</i>						
<i>Best Practice</i>	<i>Oversized cooling towers are utilized to aid in ensuring lower condenser water temperatures to chillers to save energy.</i>						

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CHILLERS AND BOILERS							
120.9	Boilers meet the requirements of this section, as required: (a) combustion air positive shut-off for boilers with input capacity of 2.5 MMBtu/y and above, (b) combustion air fan motors 10 hp or larger have variable speed drive or controls to limit fan motor demand to no more than 30% of total design wattage at 50% of design air volume, and (c) boilers with input capacity of 5 MMBtu/h and greater maintain excess oxygen concentrations at less than or equal to 5.0%.						
140.4(i)	Chilled water plants have no more than 300 tons provided by air-cooled chillers.						
140.4(k) 2	When a chilled water system includes more than one chiller, flow through any chiller is automatically shut off when that chiller is shut off while still maintaining flow through other operating chiller(s).						
140.4(k) 3	When a hot water plant includes more than one boiler, provisions shall be made so that flow through any boiler is automatically shut off when that boiler is shut off while still maintaining flow through other operating boiler(s).						
140.4(k) 4	Systems with a design capacity exceeding 500,000 Btu/hr supplying chilled or heated water shall include controls that automatically reset supply water temperatures as a function of representative building loads or outside air temperature.						
Best Practice	<i>Chillers are sequenced optimally, taking into consideration the current load and part load efficiencies of chillers. This sequence is clear in the sequences of operation.</i>						
Best Practice	<i>Total kW/ton efficiency calculation is performed for the most likely outdoor air conditions for low to high chiller loads. Condenser water temperature, chilled water temperature, and which chillers are ON is optimized at each condition and specified in a sequence.</i>						
Best Practice	<i>Sequences clearly describe how boiler and chiller short cycling will be avoided at low loads. Minimum flow rates are clearly described in the sequences. Installation of equipment and piping are consistent with the sequence.</i>						
Best Practice	<i>Chiller with a variable-speed compressor is used or was considered.</i>						
Best Practice	<i>Heating water systems with condensing boilers utilize low return water temperatures to increase boiler efficiency (and heating water coils are correspondingly "oversized").</i>						
Best Practice	<i>Boiler staging control is incorporated to take advantage of boiler part load efficiencies and to optimize total plant efficiency.</i>						
Best Practice	<i>A narrative is provided that explains how the continuous turn-down ratio or size of the smallest chiller or boiler is in line with the lowest expected heating and cooling load that will occur frequently or be experienced for any significant length of time (assessed by asking the designer for the results of their calculations, and taking into account off-season and off-hours operation and the less than fully occupied condition that may exist for years). Some cycling is expected at the lowest loads, but cycling should be limited to manufacturer recommendations.</i>						

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Best Practice	<i>Heat recovery chillers are incorporated for domestic hot water or low temperature heating water for space heating or for outdoor air pre-heating and heating coils designed for the lower temperature water.</i>						
Best Practice	<i>The cooling central plant equipment is designed to efficiently handle the smallest conceivable load without excessive cycling and without using inefficient techniques like hot gas bypass/reinjection.</i>						
HYDRONIC SYSTEMS - PUMPING							
140.4(k) 1	Chilled and hot water pumping are designed for variable flow and are capable of reducing pump flow rates to no more than the larger of a) 50% or less of design flow rate or b) minimum flow required by equipment manufacturer.						
140.4(k) 6.A	Individual pumps serving variable flow systems with motor horsepower greater than 5 hp have controls or devices that result in pump motor demand of no more than 30% of design wattage at 50% of design water flow. Pumps shall be controlled as a function of required differential pressure.						
140.4(k) 6.B	For systems without DDC, differential pressure shall be measured at the most remote heat exchanger or at the heat exchanger requiring greatest differential pressure. For systems with DDC, static pressure set point shall be reset based on valve requiring most pressure and the set point shall be no less than 80% open.						
Best Practice	<i>In variable flow systems, there are no 3-way valves. The only exception should be for a valve with an opening limit or a balanced bypass line that is sized for the lowest flowrate at which the pump can operate without overheating. Sequences of operations show that this valve is to be opened only after all coil valves are closed.</i>						
Best Practice	<i>For each hydronic flow meter, the location is shown on the drawings with detail notes indication length of straight pipe required up and down stream of that sensor.</i>						
Best Practice	<i>Flow meters used for control in open cooling tower systems utilize magnetic or ultra-sonic meters rather than in-flow paddle meters that are prone to damage and clogging.</i>						
Best Practice	<i>There are pump impeller trim requirements for non-VFD controlled motors over 5 hp, if throttling more than 20 percent is required to meet design. For pumps greater than 20 hp controlled by VFD's, if more than 30% throttling is required at design loads, the pump impellers shall be trimmed.</i>						
Best Practice	<i>Pumps are not oversized. The capacity of each pump does not exceed the sum of the coil capacities served. (No additional safety factor is needed, since the normal coil load diversity provides the pump safety factor).</i>						
Best Practice	<i>Single line flow diagrams are shown in the drawings for major systems including the chilled water and heating water. These diagrams include the complete path of water through the system with coils, dampers, pumps, valves, flow rates, and sensors shown.</i>						
Best Practice	<i>Balancing valves (like triple duty valves) should not be installed on the discharge on variable speed pumps as they are a constant unnecessary pressure drop. The variable speed adjusts for design flow, so the valve is not needed.</i>						

COMMISSIONING – CONSTRUCTION DOCUMENTS

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Commissioning - Construction Documents

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Project Name:

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Best Practice	<i>In constant flow hydronic loops, hydronic balancing valves are shown at: each non-VFD controlled pump, major zone or floor branch takeoffs, parallel cooling towers and chillers that are not symmetrically piped or are different sizes and at all coils. Specifications require marking or setting set screws at final valve positions. Requirements should also be found in the specifications.</i>						
HYDRONIC HEAT PUMP (WLHP)							
140.4(k) 7	Hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection and heat addition shall have controls that are capable of providing a heat pump water supply temperature dead band of at least 20°F between initiation of heat rejection and heat addition by the central devices.						
NOTES							

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	NRCC-CXR-04-E
Construction Documents	(Page 1 of 1)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

COMMISSIONING – DESIGN REVIEW SIGNATURE PAGE

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CERTIFICATE OF COMPLIANCE		NRCC-CXR-05-E
Commissioning - Design Review Signature Page		(Page 1 of 1)
Project Name:	Date Prepared:	

General Information		
Climate Zone:	Building Type:	Conditioned Area (sf):
Reviewer's Name:	Reviewer's Agency:	
Enforcement Agency:	Permit Number:	
Enforcement Agency Use: Checked by	Enforcement Agency Use: Date	

120.8(d): DESIGN REVIEW	
--------------------------------	--

Date of Design Review Kickoff		/ /
Owner/Owner's Representative (Print Name):	Signature :	Date:
Design Engineer (Print Name):	Signature :	Date:
Design Reviewer (Print Name):	Signature :	Date:

Date of Construction Document Checklist Completion		/ /
Checklists Completed:		
GENERAL CHECKLIST - COMPLETED BY ALL BUILDINGS	YES <input type="checkbox"/> NO <input type="checkbox"/>	
HVAC SIMPLE	YES <input type="checkbox"/> NO <input type="checkbox"/>	
HVAC COMPLEX	YES <input type="checkbox"/> NO <input type="checkbox"/>	
Owner/Owner's Representative (Print Name):	Signature :	Date:
Design Engineer (Print Name):	Signature :	Date:
Design Reviewer (Print Name):	Signature :	Date:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

Electrical Power Distribution

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CERTIFICATE OF COMPLIANCE	NRCC-ELC-01-E
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Project Name:	Date Prepared:

Project Address:	Climate Zone:	Conditioned Floor Area : Unconditioned Floor Area :
General Information		
Building Type:	<input type="checkbox"/> Nonresidential <input type="checkbox"/> High-Rise Residential <input type="checkbox"/> Hotel/Motel	
<input type="checkbox"/> Schools <input type="checkbox"/> Relocatable Public Schools	<input type="checkbox"/> Conditioned Spaces <input type="checkbox"/> Unconditioned Spaces	
Phase of Construction:	<input type="checkbox"/> New Construction <input type="checkbox"/> Addition <input type="checkbox"/> Alteration	

1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

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A. Electrical Service Metering

☐ Each newly installed electrical service (in both existing and newly constructed buildings) is required to be metered, as set out in Table 130.5-A, which is reproduced below.

☐ Fill out a separate line for each electrical service that is connected to the building.

Electrical Service Schedule	Electrical Service Rating	Metering Capabilities (check all that are present)				Field Inspector	
		C	D	E	F	Pass	Fail
A	B	C	D	E	F	Pass	Fail
Designation/location in building/description	kVA	Instantaneous (at the time) kW demand	Historical peak demand (kW)	Resettable kWh	kWh per rate period	Pass	Fail
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 130.5-A - MINIMUM REQUIREMENTS FOR METERING OF ELECTRICAL LOAD

Meter Rating (kVA)	50 kVA or less	More than 50kVA and less than or equal to 250 kVA	More than 250 kVA and less than or equal to 1000kVA	Services rated more than 1000kVA
Instantaneous (at the time) kW demand	Required	Required	Required	Required
Historical peak demand (kW)	Not required	Not required	Required	Required
Resettable kWh	Required	Required	Required	Required
kWh per rate period	Not required	Not required	Not required	Required

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B. Disaggregation of Electrical Circuits

- ☐ Each newly installed switchboard, panel, and motor control center (in both existing and newly constructed buildings) is required to be disaggregated according to the requirements of Table 130.5-B, shown on the next page.
- ☐ Individual branch circuits, taps or disconnects that require overcurrent protection devices rated 60A or greater are exempt.
- ☐ As an alternative, current transformers can be added for individual branch circuits and loads throughout the building, and a permanent measurement system can be installed. In this case, disaggregated wiring would not be required as long as the metering system allows the equivalent disaggregated measurements.
- ☐ Fill out a separate line for each switchboard, motor control center, panelboard and subpanel.

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B. Disaggregation of Electrical Circuits (continued)**Table 130.5-B - MINIMUM REQUIREMENTS FOR SEPARATION OF ELECTRICAL LOAD**

Table 130.5 – B sets the upper limit on how many load(s) of each type can be supplied by each feeder. A feeder may not supply loads of more than one type unless the service is rated at 50 kVA or less. For instance, on the fifth row of the table, one feeder on a service >50 kVA could be used to supply all the plug loads on a floor of a building, provided that there are no areas in which more than 25kVA of plug load is supplied to a space less than 5000sf

Load Type	Services rated 50 kVA or less	Services rated more than 50kVA and less than or equal to 250 kVA	Services rated more than 250 kVA and less than or equal to 1000kVA	Services rated more than 1000kVA
Lighting including exit and egress lighting and exterior lighting	Not required	All lighting in aggregate	All lighting disaggregated by floor, type or area	All lighting disaggregated by floor, type or area
HVAC systems and components including chillers, fans, heaters, furnaces, package units, cooling towers, and circulation pumps associated with HVAC	Not required	All HVAC in aggregate	All HVAC in aggregate and each HVAC load rated at least 50 kVA	All HVAC in aggregate and each HVAC load rated at least 50kVA
Domestic and service water system pumps and related systems and components	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Plug load including appliances rated less than 25 kVA	Not required	All plug load in aggregate Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug loads separated by floor, type or area. All groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf
Elevators, escalators, moving walks, and transit systems	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Other individual non-HVAC loads or appliances rated 25kVA or greater	Not required	All	Each	Each
Industrial and commercial load centers 25 kVA or greater including theatrical lighting installations and commercial kitchens	Not required	All	Each	Each
Renewable power source (net or total)	Each group	Each group	Each group	Each group
Loads associated with renewable power source	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Charging stations for electric vehicles	All loads in aggregate	All loads in aggregate	All loads in aggregate	All loads in aggregate

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C. Voltage Drop

- ☐ Attach voltage drop worksheet to this form,
- ☐ Field inspector has discretion to approve the worksheets; the tables shown below in this section are advisory only
- ☐ Feeder conductors and branch circuits that are dedicated to emergency services are exempt from these requirements.
- ☐ To calculate branch circuit length, the approximate centroid of the load may be used if the actual conductor length is not known.
- ☐ When calculating branch circuit loads, receptacle loads may be derated using a load factor of 75%
- ☐ An advisory table of typical power factors is shown below
- ☐ Advisory tables of typical maximum feeder and branch circuit lengths are shown on the following page. Tables assume 1.0 power factor and that the circuit current is 80% of the rated value.

	Field Inspector	
	Pass	Fail
Feeders. Feeder conductors shall be sized for a maximum voltage drop of 2 percent at design load.	<input type="checkbox"/>	<input type="checkbox"/>
Branch Circuits. Branch circuit conductors shall be sized for a maximum voltage drop of 3 percent at design load.	<input type="checkbox"/>	<input type="checkbox"/>

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Compliance Manual, Chapter 8, Table 8 2: Typical Power Factors for Voltage Drop Calculations

Load Type	Default Power Factor at 120 volts	Default Power Factor at 277 volts	Clarifying Notes
Fluorescent lighting	0.95	0.95	
Compact fluorescent lighting	0.9 (hardwired) 0.5 (GU-24)	0.9 (hardwired) 0.3 (GU-24)	NPF magnetic ballasts use GU-24 values
LED lighting	0.7	0.5	May be higher if specifications call for high power factor drivers
Incandescent lighting	1.0	1.0	
HID lighting	0.9	0.9	May be lower if NPF ballasts are specified
HVAC packages	0.85	0.9	
Other motors <5 HP	0.8	0.8	
Other motors >5 HP	0.85	0.85	
Kitchen equipment	0.9	N/A	
Receptacles	0.6	N/A	For dedicated receptacles, may be rated according to the load
Electric heating including hot water	1.0	1.0	
Other	0.85	0.85	

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C. Voltage Drop (continued)

Compliance Manual, Chapter 8, Table 8 5 Voltage Drop for Common Copper Wire Gauges and Current Loads

Wire gauge	Circuit Current (Amps)	Maximum Feeder Length (feet)					Maximum Branch Circuit Length (feet)				
		120	208	240	277	480	120	208	240	277	480
14	12	39	67	78	90	156	58	101	117	135	233
12	16	46	80	93	107	185	69	120	139	160	278
10	24	48	83	96	111	192	72	125	144	166	288
8	32	57	99	115	132	229	86	149	172	199	344
6	40	73	127	146	169	293	110	190	220	253	439
4	52	89	154	178	206	356	134	232	267	309	535
2	72	103	178	206	237	412	154	267	309	356	617
0	96	123	212	245	283	490	184	319	368	424	735
00	108	137	238	274	317	549	206	357	412	475	823
0000	144	163	283	327	377	654	245	425	490	566	980
250 (kcmil)	164	170	294	340	392	679	255	441	509	588	1019
300	184	181	314	362	418	725	272	471	543	627	1087
350	200	195	338	390	450	779	292	506	584	675	1169
500	248	224	388	448	517	896	336	582	672	776	1344

Compliance Manual, Chapter 8, Table Error! No text of specified style in document.-1 Voltage Drop for Common Aluminum Wire Gauges and Current Loads

Wire gauge	Circuit Current (Amps)	Maximum Feeder Length (feet)					Maximum Branch Circuit Length (feet)				
		120	208	240	277	480	120	208	240	277	480
14*	12	24	41	47	55	95	36	62	71	82	142
12*	16	28	49	56	65	113	42	73	85	98	169
10	24	29	51	59	68	118	44	76	88	102	176
8	32	35	61	70	81	140	53	91	105	121	210
6	40	45	77	89	103	178	67	116	134	154	267
4	52	54	94	109	126	218	82	142	163	188	327
2	72	62	108	125	144	250	94	162	187	216	375
0	96	74	129	149	172	298	112	193	223	258	446
00	108	84	145	167	193	334	125	217	251	289	501
0000	144	99	172	198	229	397	149	258	298	344	595
250	164	103	179	207	239	413	155	269	310	358	620
300	184	111	192	221	255	442	166	287	332	383	663
350	200	119	206	238	274	475	178	309	356	411	713
500	248	137	237	273	316	547	205	355	410	473	820

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D. Circuit Controls for 120-Volt Receptacles

- ☐ Controlled 120 volt receptacles shall be provided, as required by Section 130.5(d) of the Standards.
- ☐ In open office areas, controlled circuit receptacles are not required if, at time of final permit, workstations are installed, and each workstation is equipped with an occupant sensing control that is permanently mounted in each workstation, and which controls a hardwired, nonresidential-rated power strip. Plug-in strips and other plug-in devices that incorporate an occupant sensor shall not be used for this exception.
- ☐ Receptacles that are only for the following purposes are exempt:
- Receptacles specifically for refrigerators and water dispensers in kitchenettes.
 - Receptacles located a minimum of six feet above the floor that are specifically for clocks.
 - Receptacles for network copiers, fax machines, A/V and data equipment other than personal computers in copy rooms.

	Field Inspector	
	Pass	Fail
1. At least one controlled receptacle is installed within 6 feet of each uncontrolled receptacle, or split-wired duplex receptacles are installed, that have one controlled and one uncontrolled receptacle. This applies in all of the following spaces: <ul style="list-style-type: none"> • Private offices, open office areas • Receptions and lobbies • Conference rooms • Kitchenettes in office spaces • Copy room 	<input type="checkbox"/>	<input type="checkbox"/>
2. Electric circuits serving controlled receptacles are equipped with automatic shut-OFF controls following the requirements prescribed in Section 130.1(c)1 through 5 (in many cases this will mean that the receptacles are connected to the same automatic shut-OFF system as the general lighting of the space).	<input type="checkbox"/>	<input type="checkbox"/>
3. Controlled receptacles shall have a permanent marking to differentiate them from uncontrolled receptacles.	<input type="checkbox"/>	<input type="checkbox"/>
4. For open office areas, controlled circuits shall be provided and marked to support installation and configuration of office furniture with receptacles that comply with Section 130.1(a)130.5(d) 1, 2, and 3.	<input type="checkbox"/>	<input type="checkbox"/>
5. For hotel and motel guest rooms at least one-half of the 120-volt receptacles in each guest room are controlled receptacles that comply with Section 130.5(d)1, 2, and 3 (see numbers 1,2 and 3 above). Electric circuits serving controlled receptacles have captive card key controls, occupancy sensing controls, or automatic controls such that, no longer than 30 minutes after the guest room has been vacated, power is switched off.	<input type="checkbox"/>	<input type="checkbox"/>
6. Plug-in strips and other plug-in devices that incorporate an occupant sensor are not used to comply with any of these requirements.	<input type="checkbox"/>	<input type="checkbox"/>

ENVELOPE COMPONENT APPROACH

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Envelope Component Approach	(Page 1 of 3)
Project Name:	Date Prepared:

A. GENERAL INFORMATION			
1	Project Location:		6 Compliance Method: <input type="checkbox"/> Component <input type="checkbox"/> Unconditioned (file Affidavit)
2	CA City and Zip Code:		7 Building Front Orientation (deg or cardinal):
3	Climate Zone:		8 Permitted Scope of Work <input type="checkbox"/> New Construction <input type="checkbox"/> Addition <input type="checkbox"/> Alteration
4	Total Conditioned Floor Area:		9 Building Type(s) <input type="checkbox"/> Nonresidential <input type="checkbox"/> High-Rise Residential <input type="checkbox"/> Hotel/Motel Guest Room
5	<input type="checkbox"/> Schools (Public School) <input type="checkbox"/> Relocatable Public School Bldg. <input type="checkbox"/> Conditioned Spaces <input type="checkbox"/> Unconditioned Spaces <input type="checkbox"/> Skylight Area for Large Enclosed Space $\geq 5000 \text{ ft}^2$ (If checked include the NRCC-ENV-04-E with submittal)		

B. ENVELOPE DETAILS – Framed										
1	2	3	4	5	6	7	8	9	10	11
Tag/ID	Assembly Type	Frame Material	Frame Depth	Frame Spacing	Appendix JA4 Reference	Cavity R-value	Continuous Insulation R-value	Proposed U-Factor	Required U-Factor From Tables, B, C, D	Comments

C. ENVELOPE DETAILS – Non-framed									
1	2	3	4	5	6	7	8	9	10
Tag/ID	Assembly Type	Assembly Materials	Thickness (inches)	Interior or Core Insulation R-value	Continuous Insulation R-value	Appendix JA4 Reference	Proposed U-Factor	Required U-Factor from Tables, B, C, D	Comments

D. ENVELOPE DETAILS – Mass										
1	2	3	4	5	6	7	8	9	10	11
Tag/ID	Mass Type	Density (lb/ft ³)	Mass Thickness (inches)	Furring Strip Thickness (inches)	Interior Insulation R-value	Exterior Insulation R-value	Appendix JA4 Reference	Proposed Insulation U-factor	Required U-Factor from Tables, B, C, D	Comments

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E. ROOFING PRODUCTS (COOL ROOF)											
1	2	3	4	5		6	7	8	9	10	11
Mass Roof 25 lb ft ² or greater	Roof Pitch	CRRC Product ID Number	Product Type	Proposed			Minimum Required			Comments	
				Aged Solar Reflectance	Thermal Emittance	SRI ² (Optional)	Aged Solar Reflectance	Thermal Emittance	SRI (optional)		
<input type="checkbox"/>				<input type="checkbox"/> ¹							
<input type="checkbox"/>				<input type="checkbox"/> ¹							
<input type="checkbox"/>				<input type="checkbox"/> ¹							
<input type="checkbox"/> An aged solar reflectance less than 0.63 is allowed provided the maximum roof / ceiling U-factor in TABLE 140.3 is not exceeded											
<input type="checkbox"/> High-rise residential buildings and Hotels and Motels with low-sloped roofs in Climate Zones 1 through 8, 12 and 16 are exempted from aged Solar Reflectance and emittance requirements.											
<input type="checkbox"/> High-rise residential buildings and Hotels and Motels with steep-sloped roofs in Climate Zones 1 and 16 are exempt from aged Solar Reflectance and emittance requirements.											
<input type="checkbox"/> The roof area covered by building integrated photovoltaic panels and building integrated solar thermal panels are exempt from aged Solar Reflectance and emittance requirements											
To apply Liquid Field Applied Coatings , the coating must be applied across the entire roof surface and meet the dry mil thickness or coverage recommended by the coatings manufacturer and meet minimum performance requirements listed in §110.8(i)4. Select the applicable coating:											
<input type="checkbox"/> Aluminum-Pigmented Asphalt Roof Coating				<input type="checkbox"/> Cement-Based Roof Coating			<input type="checkbox"/> Other _____				
NOTES: 1. Check the box if the aged Solar reflectance was not available in the Cool Roof Rating Council's Rated Product Directory, Then use the equation in Section 110.8(i)2 where the Initial Reflectance value from the same directory and use the equation $(0.2 + B(p_{initial} - 0.2))$ to obtain a calculated aged value. Where p is the Initial Solar Reflectance and B is either set to 0.65 for Field-Applied Coatings or it is set to 0.70 for all other roofing products other than Field-Applied Coating. 2. Calculate the SRI Value by using the SRI-Worksheet at (TBD) and enter the resulting value in the SRI Column above and attach a copy for the SRI-Worksheet NRCC-ENV-03-E to the to this form.											

F. Air Barrier				
1	2	3	4	5
Tag/ID	Air Barrier Material Type	Air Barrier Assembly Type	Whole Building Air Leakage Testing	Comments

ENVELOPE COMPONENT APPROACH

CEC-NRCC-ENV-01-E (Revised 06/13)



CERTIFICATE OF COMPLIANCE	NRCC-ENV-01-E
Envelope Component Approach	(Page 3 of 3)
Project Name:	Date Prepared:

G. FENESTRATION PROPOSED AREAS AND EFFICIENCIES

1	2	3	4	5	6	7	8	9	10	11	12
Tag/ID	Fenestration Type	Area	Orientation N, S, W, E or Roof	# of Panels	Max U-Factor	Overhang	Max (R)SHGC	Min VT	Label	Conditions Status	Comments

H. ENVELOPE MANDATORY MEASURES

Indicate location on building plans of Mandatory Envelope Measures Note Block: _____

INSTRUCTIONS TO APPLICANT ENVELOPE COMPLIANCE & WORKSHEETS (check box if worksheet are included)*For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, please refer to the Nonresidential Compliance Manual.*

- ☐ NRCC-ENV-01-E Certificate of Compliance. Required on plans for all submittals.
- ☐ NRCC-ENV-04-E Use when minimum skylight requirements for large enclosed spaces are required in climate zones 2 through 15. Optional on plans.

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300.

Prescriptive NRCC-ENV-01-E Instructions

Minimum requirements for prescriptive compliance can be found in Building Energy Efficiency Standards Section 140.3(a), and Tables 140.3-B, C and D. Completing these forms will require that you have the Reference Appendices for the 2013 Building Energy Efficiency Standards, which contains the Joint Appendices used to determine climate zone and to complete the table for opaque surfaces. When the term ENV-1E is used it means the NRCC-ENV-01-E. Worksheets are identified by their entire name and subsequently by only the worksheet number, such as ENV-01-E.

Instructions for tables with column numbers and row letters are given separately.

A. GENERAL INFORMATION

Project Name: Identifying information, such as owner's name.

Date: Date of document preparation.

Project Location: Enter legal street address of property or other applicable location identifying information.

CA City: Legal city/town of property and **Zip Code:** 5-digit zip code for the project location (used to determine climate zone).

Climate zone: From Joint Appendix JA2.1.1.

Total Conditioned Floor Area: Indicate the total conditioned floor area.

Building Type: Indicate Nonresidential, High-Rise Residential or Hotel/motel Guest Room.

Compliance Method: Component, unconditioned (file Affidavit).

Building Front Orientation: Building front expressed in degrees, where North = 0, East = 90, South = 180, and West = 270. Indicate cardinal if it is a subdivision or multi-family project that will be built in multiple orientations. The standards (section 100.1) include the following additional details for determining orientation:

- Cardinal covers all orientations (for buildings that will be built in multiple orientations);
- North is oriented to within 45 degrees of true north, including 45 degrees east of north;
- East is oriented to within 45 degrees of true east, including 45 degrees south of east;
- South is oriented to within 45 degrees of true south, including 45 degrees west of south;
- West is oriented to within 45 degrees of true west, including 45 degrees south of west.

Phase of Construction: Newly constructed building, new Addition to an existing building or Alteration to an existing building.

Building Type: Indicate if the building is a Nonresidential, High-Rise residential or Hotel/Motel Guest Room.

B. ENVELOPE DETAILS – Framed

1. Tag/ID: A label (if any) from the plans, such as A1.4 or wall.
2. Assembly Type: Roof, Ceiling, Wall, Floor over crawlspace or floor over exterior.
3. Frame Material: Wood or Metal.
4. Frame Depth: Nominal dimensions (in inches) of framing material such as 2x4 or 2x6.
5. Frame Spacing: 16 or 24 (inches on center).
6. Appendix JA4 Reference: enter the JA4 Table and cell (column/row) (e.g., 4.3.13 D6) used to determine the assembly U-factor. If an assembly is not available on JA4, attach a Worksheet for EZ Frame. If multiple assemblies are needed to achieve a weighted average U-factor, attach a NRCC-ENV-06-E (Area Weighted Average Calculation Worksheet) form.
7. Cavity R-value: Cavity R-value: insulation installed between framing members. NOTE: Wall U-factor required for all climate zones is 0.065. This U-factors can be met by wood framed 2x4 walls with R-13 cavity + R5 continuous insulation, R-15 cavity plus R-4 continuous insulation, or any combination of cavity and/or continuous insulation that results in a U-factor equal to or less than 0.065.
8. Continuous Insulation: R-value of rigid or continuous insulation (not interrupted by framing).
9. U-factor: The U-factor for the proposed assembly. Must be less than or equal to column 10 or have an attached NRCC-ENV-06-E to show that a weighted U-factor for multiple assemblies will meet the maximum value in column 10.
10. Required U-factor: from Tables 140.3 B, C or D: Value required based on climate zone and assembly type.
11. Field Inspection: A field inspector verifies if the requirement has been met.

C. ENVELOPE DETAILS – Non-framed

1. Tag/ID: A label (if any) from the plans, for example, A1.4 or wall.
2. Assembly Type: Roof, Wall.
3. Assembly materials: SIP OSB, SIP I-Joist, see JA4 for guidance.
4. Thickness: Thickness in inches.
5. Interior or Core Insulation R-value: Insulation installed within the materials or on the inside. See Joint Appendix JA4 for guidance.
6. Continuous Insulation R-value: Insulation installed on the exterior. See Joint Appendix JA4 for guidance.
7. Appendix JA4 Reference: enter the JA4 Table and cell (column/row) (e.g., 4.3.2 A13) used to determine the assembly U-factor. If an assembly is not available on JA4, attach a Worksheet for EZ Frame. If multiple assemblies are needed to achieve a weighted average U-factor, attach a NRCC-ENV-06-E (Area Weighted Average Calculation Worksheet) form.
8. U-factor: The U-factor for the proposed assembly. Must be less than or equal to column 9 or have an attached NRCC-ENV-06-E to show that a weighted U-factor for multiple assemblies will meet the maximum value in column 9.
9. Required Assembly U-factor from Tables 140.3 B, C or D: Based on assembly type and climate zone.
10. Field Inspection: A field inspector verifies if the requirement has been met.

D. ENVELOPE DETAILS – Mass

1. Tag/ID: A label (if any) from the plans, for example, A1.4 or wall.
2. Mass Type: ICF, Masonry. See JA4 for guidance.
3. Density: indicate the Density of the product being used in lb/ft³.
4. Mass Thickness: Thickness (in inches) of mass.
5. Furring Strips Thickness: If furring strips are required to meet the required wall U-factor shown in columns 10, indicate the thickness of the furring strip (in inches). See Table 4.3.14 of Joint Appendix 4.
6. Interior Insulation R-value: Enter the R-value of proposed insulation on the inside surface of the mass wall. See column 10 for the required insulation value for the wall type selected. See JA4 for guidance. Use the same descriptor (R-value or U-factor).
7. Exterior Insulation R-value: Enter the R-value of proposed insulation on the outside surface of the mass wall. See column 10 for the required insulation value for the wall type selected. See JA4 for guidance.
8. Appendix JA4 Table: Table number used to determine the U-factor (e.g., an ICF wall is 4.3.13).
9. U-factor: The U-factor for the proposed assembly. Must be less than or equal to column 9 or have an attached NRCC-ENV-06-E to show that a weighted U-factor for multiple assemblies will meet the maximum value in column 9.
10. Required U-factor: from Tables 140.3 B, C or D: Value required based on climate zone and assembly type.
11. Field Inspection: A field inspector verifies if the requirement has been met.

E. ROOFING PRODUCTS - COOL ROOF

Roofing requirements are found in Sections 110.8(i) and 140.3(i). Depending on the climate zone and roof slope, a cool roof (defined as a minimum aged solar reflectance and thermal emittance, or a minimum SRI) may be required by Tables 140.3 B, C or D.

1. Mass roof 25 lb/ft² or greater: Mass roofs are not required to have a cool roof even if the climate zone specifies minimum performance requirements.
2. Roof Pitch: Expressed as 4:12, for example, which means the roof rises 4 foot within a span of 12 feet. When roofs have multiple pitches the requirements are based on the pitch of 50% or more of the roof.
3. The CRRC Product ID Number is obtained from the Cool Roof Rating Council's Rated Product Directory at www.coolroofs.org/products/search.php. Products are listed by manufacturer, brand, and type of installation, roofing material, and color, as well as product performance.
4. Product type: See Cool Roof Rating Council's directory. Generally product types include single-ply roof, wood shingles, asphalt roof, metal roof, and tile roof.
5. Proposed Aged Solar Reflectance: Value is from the Cool Roof Rating Council's Rated Product Directory. If the aged value is not available, calculate the SRI using the initial solar reflectance on NRCC-ENV-03-E (Cool Roof and SRI Worksheet).
6. Proposed Thermal Emittance: From the product specifications. Skip this value if using a calculated SRI.
7. Proposed SRI: It is optional to meet either the SRI or the solar reflectance/thermal emittance. To calculate the SRI value use calculation from <http://www.energy.ca.gov/title24/>. Enter the resulting value in the SRI Column above and attach a copy of the WS-04.
8. Minimum Required Aged Solar Reflectance: Based on climate zone and roof slope.
9. Minimum Required Thermal Emittance: Based on climate zone and roof slope.
10. Minimum SRI: Based on climate zone and roof slope.

11. Comments: Any notes regarding location, unique conditions, or attachments, such as an SRI worksheet. If the cool roofing requirements will be met by a liquid field applied coating, Section 110.8(i)4 requires the coating be applied across the entire roof surface and meet the dry mil thickness or coverage recommended by the manufacturer.

F. AIR BARRIER

1. Indicate the identifying name of the opaque surface (i.e., West Wall #1, Roof #1 or Floor #1)
2. Identify the material type being used as the air barrier. Include product data/specification sheet showing conformance to leakage testing to meet an air permeance not exceeding 0.004 cfm/ft², under a pressure differential of 0.3 in. w.g. (1.57 psf) (0.02 L/m² at 75 pa), when tested in accordance with ASTM E2178.
3. Identify the assembly type being used as the air barrier. Include product data/specification sheet showing conformance to leakage testing to meet an air permeance not exceeding 0.04 cfm/ft², under a pressure differential of 0.3 in. w.g. (1.57 psf) (0.2 L/m² at 75 pa), when tested in accordance with ASTM E2357, ASTM E1677, ASTM E1680, or ASTM E283.
4. Indicate whether air leakage testing of the entire building has been conducted and the results of the test. The entire building shall have an air leakage rate not exceeding 0.40 cfm/ft² at a pressure differential of 0.3 in w.g. (1.57 psf) (2.0 L/ m² at 75 pa), when the entire building is tested, after completion of construction, in accordance with ASTM E779 or another test method approved by the Commission.
5. Provide any comments necessary to explain the details of measures used for compliance.

G. FENESTRATION/GLAZING AREAS ALLOWED

1. **Tag/ID** – Provide a name or designator for each unique type of fenestration surface. This designator should be used consistently throughout the plan set (elevations, finish schedules, etc.) such as, Window-1, Skylight-1 and etc...to identify each surface. It should also be consistently used on the other forms in the compliance documentation.
2. **Fenestration Type:** Indicate the type of fenestration construction such as: Fixed Window, Operable Window, Curtainwall or Storefront, Glazed Doors. For Skylights use: Glass Curb Mounted, Glass Deck Mounted or Plastic curb Mounted.
3. **Surface area** indicates the in square feet (sf.) of each fenestration type.
4. **Orientation** Indicates the orientation of each fenestration type (N, S, W, E or Roof for skylights).
5. **Number of panes** indicates for each fenestration type.
6. **Maximum U-factor** indicates of each fenestration type. Values listed in Column 6, 8 and 9 are determined from **NRCC-ENV-02-E** allowed columns and must be equal or better than the total weighted average values listed in Table 140.3-B or C or D.
7. **Overhangs:** Indicate whether overhangs are part of the fenestration control scheme. Calculations for overhangs must be completed if Column 7 indicates, Yes. Use Env-2C Window Details to calculate the Relative Solar Heat Gain effect of the overhang.
8. **Max (R) SHGC** indicates the shading provided for each fenestration type based on the fenestration's [relative] solar heat gain coefficient ((R) SHGC). Values listed in Column 6, 8 and 9 are determined from **NRCC-ENV-02-E** allowed columns and must be equal or better than the total weighted average values listed in Table 140.3-B or C or D. Use Env-2C Window Details to calculate the Relative Solar Heat Gain effect of the overhang.
9. Indicate the **visible transmittance** (VT) of the fenestration type. Values listed in Column 6, 8 and 9 are determined from **NRCC-ENV-02-E** allowed columns and must be equal or better than the total weighted average values listed in Table 140.3-B or C or D.
10. **Label** Indicates where the label was derived for each fenestration type. Indicate if the efficiency values from NFRC Label Certificate or from the CEC Default Values. Enter NFRC or CEC (FC-1).
11. **Condition status** indicates the condition or status of each fenestration type (i.e., New, Existing or Upgrade).
12. Provide any **comments** that help provide details of fenestration performance elements used for compliance.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

FENESTRATION WORKSHEET

CEC-NRCC-ENV-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

**CERTIFICATE OF COMPLIANCE**

NRCC-ENV-02-E

Fenestration Worksheet

(Page 1 of 3)

Project Name:

Date Prepared:

A. WINDOWS DETAILS Worksheet §140.3(a)5B and C

NOTE: Newly installed fenestration shall have a certified NFRC Label Certificate or use the CEC default tables found in Table 116-A and Table 116B. Site-built fenestration less than 1,000 ft², or more than or equal to 1,000 ft² see Reference Nonresidential Appendix NA6.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tag/ID	Window Type (e.g., Window-1)	Area	Fenestration						Overhang				
			U-Factor		SHGC		VT		Dimensions			Calculated	
			Proposed	Allowed	Proposed	Allowed	Proposed	Allowed	H	V	H/V	(R)SHGC Proposed	Max (R)SHGC Allowed

B. WEST WINDOW AREA CALCULATION See §140.3(a)5A in the Energy Standards

A. Gross West Exterior Wall Area		ft ² × 0.40 =	ft ²	40% of Gross West Facing Exterior Wall Area; or
B. West Display Linear Perimeter		FT × 6 ft =	ft ²	West Display Perimeter Area
C. Enter Larger of A or B			ft ²	Maximum Standard West Area
D. Enter Proposed West Window Area			ft ²	Proposed West Window Area

*Note: If the PROPOSED **WEST** WINDOW AREA is greater than the MAXIMUM STANDARD **WEST** AREA then the envelope component approach may not be used.*

C. WINDOW AREA CALCULATION for all other orientations other than West - See §140.3(a)5A in the Energy Standards

E. Gross Exterior Wall Area		ft ² × 0.40 =	ft ²	40% of Gross Exterior Wall Area or
F. Linear Display Perimeter		FT × 6 ft =	ft ²	Display Perimeter Area
G. Enter The Larger of E or F			ft ²	Maximum Standard Area
H. Enter Proposed Window Area			ft ²	Proposed Window Area

Note: If the PROPOSED WINDOW AREA is greater than the MAXIMUM STANDARD AREA then the envelope component approach may not be used.

D. SKYLIGHT AREA CALCULATION See §143(a)6A in the Energy Standards

FENESTRATION WORKSHEET

CEC-NRCC-ENV-02-E (Revised 06/13)

**CERTIFICATE OF COMPLIANCE**

NRCC-ENV-02-E

Fenestration Worksheet

(Page 2 of 3)

Project Name:

Date Prepared:

	ACTUAL GROSS ROOF AREA		STANDARD ALLOWED SKYLIGHT AREA	
A. IF Atrium/Skylight Height is ≤ 55 ft; or		$\text{ft}^2 \times 0.05 =$	ft^2	
B. IF Atrium/Skylight Height is > 55 ft		$\text{ft}^2 \times 0.10 =$	ft^2	
C. Proposed Skylight Area (from plans)		ft^2		
D. Skylight SSR % ^{1, 2} = Proposed Skylight Area <u>Divided</u> by Actual Gross Roof Area =		%		
1. If the SKYLIGHT SSR % is less than or equal to 5% then choose the appropriate column in Table 140.3-B and C and row in Table 140.3-D. 2. If the SKYLIGHT SSR % is greater than 5% then the Envelope Component Approach may not be used.				

E. RELOCATABLE PUBLIC SCHOOL BUILDINGS - See Section 140.3(a)8 in the Energy Standards**Option 1**

<input type="checkbox"/> For Specific Climate Zone, use Table 140.3-B - Prescriptive Envelope Criteria.	<input type="checkbox"/> Specific Climate Zone Metal Identification Label – Place two labels on each relocatable school building and indicate on the building plans.
	Indicate location from the building plans:

Option 2

<input type="checkbox"/> For Any (All) Climate Zone, use Table 140.3-D - Prescriptive Envelope Criteria.	<input type="checkbox"/> Any (All) Climate Zone Metal Identification Label - Place two labels on each relocatable school building and indicate on the building plans.
	Indicate location from the building plans:

FENESTRATION WORKSHEET

CEC-NRCC-ENV-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

**CERTIFICATE OF COMPLIANCE**

NRCC-ENV-02-E

Fenestration Worksheet

(Page 3 of 3)

Project Name:

Date Prepared:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:

Documentation Author Signature:

Company:

Signature Date:

Address:

CEA/ HERS Certification Identification (if applicable):

City/State/Zip:

Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:

Responsible Designer Signature:

Company :

Date Signed:

Address:

License:

City/State/Zip:

Phone:

CERTIFICATE OF COMPLIANCE – DATA FIELD DEFINITIONS AND CALCULATIONS	NRCC-ENV-02-E
Fenestration Worksheet	(Page 1 of 3)

WINDOW DETAILS WORKSHEET

1. **Tag/Id** – Provide a name or designator for each unique type of fenestration surface. This designator should be used consistently throughout the plan set (elevations, finish schedules, etc.) such as, Window-1, Skylight-1 and etc...to identify each surface. It should also be consistently used on the other forms in the same compliance documentation.
2. **Window Type** – *Fixed Window, Operable Window, Curtainwall or Storefront, or Glazed Doors. For Skylights use either Glass Curb Mounted, Glass Deck Mounted or Plastic curb Mounted.*
3. **Surface Area** – Indicate the total ft² of all of the fenestration with the same like characteristics.
4. **Fenestration/U-factor/Proposed** – Indicate the proposed U-factor for windows from **NRCC-ENV-01-E**, Area weighted average or from Table 140.3-B, C or D, NFRC Label Certificate or the Energy Commission's Default Table U-factors Table 110.6-A.
5. **Fenestration/U-factor/Allowed** – Indicate the Maximum Allowed U-factor for windows from Table 140.3-B, C or D.
6. **Fenestration/SHGC/Proposed** – Indicate the proposed SHGC for windows from **NRCC-ENV-01-E**, Area weighted average or from Table 140.3-B, C or D, NFRC Label Certificate or the Energy Commission's Default Table U-factors Table 110.6-A.
7. **Fenestration/SHGC/Allowed** – Indicate the Maximum Allowed SHGC for windows from Table 140.3-B, C or D.
8. **VT/Proposed** – Indicate the proposed VT for windows from NRCC-ENV-01-E, Area weighted average or from Table 140.3-A, B or C, NFRC Label Certificate or the Energy Commission's Default Table U-factors Table 110.6-A.
9. **VT/Allowed** – Indicate the Maximum Allowed Prescriptive VT for windows from Table 140.3-B, C or D. Note the VT requirement is dependent of window Type in Column 2.

If overhangs are going to be used in the project then the overhangs dimensions and location should be indicated on the building plans for verification by the enforcement agency

10. **Overhang/Dimensions/H** – Horizontal distance from window out to the bottom of overhang. If an overhang does not exist, then the H is 1.0.
11. **Overhang/Dimensions/V** – Vertical distance from bottom of window to a plane at the same height as the bottom of lower edge of overhang. If an overhang does not exist, then the V is 1.0.
12. **Overhang/Dimensions/H/V** – Use OVERHANG FACTOR to determine the factor for each orientation. Measure the horizontal projection of the overhang (H) and the vertical height from the bottom of the glazing to the shading cut-off point of the overhang (V). If an overhang does not exist, then the overhang factor is 1.0.
13. **Calculated/(R)SHGC** – Proposed is calculated by multiplying the Overhang Factor by the proposed SHGC of the window.
14. **Calculated/Max(R)SHGC** – Allowed is the maximum relative solar heat gain allowed, taken from Standards Tables 140.3-B, C or D for the appropriate window orientation (north or non-north).

WEST WINDOW AREA CALCULATIONS

This calculation determines whether the window area for the building exceeds the allowable maximum for the Envelope Component Approach.

CERTIFICATE OF COMPLIANCE – DATA FIELD DEFINITIONS AND CALCULATIONS	NRCC-ENV-02-E
Fenestration Worksheet	(Page 2 of 3)

- A. **Gross West Exterior Wall Area** – It's the Gross Exterior Wall Area multiplied by 0.40 to determine the maximum allowed 40 percent of fenestration in the West Exterior Wall Area.
 - B. **West Display Perimeter** – It's the West linear perimeter multiplied by 6 ft to determine the maximum DISPLAY AREA for glazing limits.
 - C. Enter the Larger of A or B for the **Maximum Standard Area**.
 - D. **Proposed West Window Area** – Enter the proposed total area of windows as indicated on the building plans.
- Note: If the Proposed West Window area is greater than the Maximum Standard West Area of 40% then the Envelope Component Approach may not be used.

WINDOW AREA CALCULATION (for all other than the West orientation)

- A. **Gross Exterior Wall Area** – It's the Gross Exterior Wall Area multiplied by 0.40 to determine the maximum allowed 40 % of fenestration in the Exterior Wall Area.
- B. **Display Perimeter** – It's the linear perimeter multiplied by 6 ft to determine the maximum DISPLAY AREA for glazing limits.
- C. Enter the Larger of E or F for the **Maximum Standard Area**.
- D. **Proposed Window Area** – Enter the proposed total area of windows as indicated on the building plans.

Note: If the Proposed Window area is greater than the Maximum Standard Area of 40% then the Envelope Component Approach may not be used.

SKYLIGHT AREA CALCULATION

This calculation determines whether the skylight area for the building exceeds the allowable maximum for the standard envelope.

- A. If the height distance from the floor to the above is less than or equal to 55 ft then multiply the Actual Gross Roof Area by 5 percent (0.05) for the **Standard Allowed Skylight Area**.
- B. If the height distance is greater than 55 ft then multiply Actual Gross Roof Area by 10 percent (0.10) for the **Standard Allowed Skylight Area**.
- C. **Proposed Skylight Areas** – The total area of proposed skylights shown on the plans is entered here.
- D. **SKYLIGHT %** - If the Proposed Skylight Area is greater than the Standard Allowed Skylight Area then the Envelope Component approach may not be used.

If the **Proposed Skylight Area** is greater than the **Standard Allowed Skylight Area** then the Envelope Component Approach may not be used. The skylight percentage determines the appropriate row for the maximum U-factor allowed TO BE USED IN THE Skylight Details. See Table 140.3 B, C or D.

RELOCATABLE PUBLIC SCHOOL BUILDINGS

Option 1

Check box if manufactured for specific climate zone.

Check box if metal identification label is provided.

Option 2

Check box if manufactured for all climate zones.

Check box if metal identification label is provided.

SOLAR REFLECTANCE INDEX CALCULATION WORKSHEET

CERTIFICATE OF COMPLIANCE		NRCC-ENV-03-E
Solar Reflectance Index Calculation Worksheet		(Page 1 of 1)
Project Name:		Date Prepared:

A. Product Information

1	CRRC Product ID Number	
2	Manufacturer	
3	Brand	
4	Model	
5	Product Type	
6	Roof Slope	

B. SRI Calculations

1	Aged Reflectance Listed with CRRC	
2	CRRC Listed Aged Solar Reflectance	
3	Initial Solar Reflectance	
4	Calculated Aged Solar Reflectance	
5	Thermal Emittance	

C. Results

1	Solar Reflective Index	
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CF1R-WKS-04-E Instructions**A. Product Information:**

1. CRRC Product ID Number, Manufacturer, Brand, Model and Product Type should be based on product information from the Cool Roof Rating Council's website. The product directory is located at <http://www.coolroofs.org/products/search.php> and may be browsed either by viewing all products or by using the search function to find a specific product. Keep in mind that inclusion in the directory does not guarantee that a product will meet the energy requirements.
2. Roof Slope: Designate the roof slope as either "less than or equal to 2:12" ($\leq 2:12$) or "greater than 2:12" ($> 2:12$). A ratio of 2:12 is approximately 9.5 degree slope. The SRI requirement is based partly on the slope of the roof.

B. SRI Calculations:

1. Aged Reflectance Listed with CRRC: Indicate whether or not your product's 3-year aged solar reflectance is listed on the CRRC website by selecting either "yes" or "no" from the drop-down list. Depending on your selection, the boxes that you will not need should become blacked out.
2. CRRC Listed Aged Solar Reflectance: If you selected "yes" to box 1, input the CRRC listed 3-year aged solar reflectance.
3. Initial Solar Reflectance: If you selected "no" to box 1, input the CRRC listed initial solar reflectance.
4. Calculated Aged Solar Reflectance: No input required. The calculator will calculate the aged reflectance using the initial reflectance once you hit enter or click outside the box. Note that the solar reflectance value will be a decimal between 0 and 1.
5. Thermal Emittance: Input the value for thermal emittance obtained from the CRRC. This value can be either the initial thermal emittance or the 3-year aged value. Note that it also must be a decimal between 0 and 1.

C. Results:

1. Solar Reflectance Index: If you have entered values for both solar reflectance and thermal emittance, once you press enter or click outside the box, the calculator will calculate the final SRI value. It may take a few moments to obtain a value for the SRI depending on the values you inputted for reflectance and emittance.

A. Product Information

1	CRRC Product ID Number	<<text (data from CF-1R)>>
2	Manufacturer	<<user input: text>>
3	Brand	<<user input: text>>
4	Model	<<user input: text>>
5	Product Type	<<text (data from CF-1R)>>
6	Roof Slope	<<text (data from CF-1R)>>
7	Product Weight	<<user input: numeric>>

B. SRI Calculation

1	Aged Reflectance Listed with CRRC	<<user pick from list: <u>Yes</u> ; <u>No</u> >>
2	CRRC Listed Aged Solar Reflectance	<<user input: numeric>>
3	Initial Solar Reflectance	<<user input: numeric>>
4	Calculated Aged Solar Reflectance	<<xxx.x (null entry, this value is calculated)>>
5	Thermal Emittance	<<user input: numeric>>

C. Results

1	Solar Reflective Index	<<xxx.x (null entry, this value is calculated)>>
---	------------------------	--

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

ENVELOPE – DAYLIT ZONE WORKSHEET

CEC-NRCC-ENV-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-ENV-04-E
Envelope - Daylit Zone Worksheet		(Page 1 of 2)
Project Name:	Date Prepared:	

*This worksheet applies only to buildings with three or fewer stories, climate zones 2 through 15, having an enclosed conditioned or unconditioned space > 5,000 ft² that is directly under a roof with a ceiling height > 15 ft and ≥ 0.5 watts per square foot, unless exempted by the **EXCEPTIONS** in §140.3(c).*

A. MINIMUM SKYLIGHT AREA FOR LARGE ENCLOSED SPACES (definitions in §130.1(d), requirements in §140.3(c))

- | | |
|----|---|
| 1. | Enter building plan reference page(s) for large enclosed space _____; and |
| 2. | Enter building plan reference page(s) for daylit zone plans for enclosed space _____ or attach a separate daylit zone design plan with this form; then Go to Step 1 below. |

B. CALCULATE DAYLIT AREA

The minimum Skylit Zone requirements can be met by using either Skylit Daylit Zones or Primary Sidelit Daylit Zones or Combinations.

Step 1 Calculate the minimum prescriptively required total Daylit Zone Area, per §140.3(c)1

1.	Floor area of enclosed space	A	ft ²	Floor area
2.	Minimum prescriptively required total daylit area is (0.75 x floor area (A) – the area of any permanent obstructions), see §140.3(c)1 & §130.1(d)1A for additional details.	B	ft ²	Minimum prescriptively required Total Daylit Zone Area

Step 2 Calculate Total Daylit Zone Area

3.	Skylit Daylit Zone Area, determined in accordance with §130.1(d)1A and as shown on the building plans.	C	ft ²	Skylit Daylit Zone Area
4.	Primary Sidelit Daylit Zone Area determined in accordance with §130.1(d)1B and as shown on the building plans.	D	ft ²	Primary Sidelit Daylit Zone Area
5.	Areas of Primary Sidelit Daylit Zone Area that overlap with the Skylit Daylit Zone Area	E	ft ²	Overlap Zone Area
6.	Total daylit Zone Area F = C+D-E	F	ft ²	Total Daylit Zone Area

C. COMPARE DAYLIT ZONE AREA
Step 1 Compare

- | | |
|----|---|
| 1. | Check if Total Daylit Zone Area (F) is equal to or greater than Minimum Prescriptively Required Daylit Zone Area (B). Space PASSES if $F \geq B$. |
|----|---|

ENVELOPE – DAYLIT ZONE WORKSHEET

CEC-NRCC-ENV-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-ENV-04-E
Envelope - Daylit Zone Worksheet		(Page 2 of 2)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

Minimum Skylight Area for Large Enclosed Spaces Worksheets

*This worksheet applies only to buildings with three or fewer stories, in climate zones 2 through 15, having an enclosed conditioned or unconditioned space > 5,000 ft² that is directly under a roof with a ceiling height > 15 ft and ≥ 0.5 watts per square foot, unless exempted by the **EXCEPTIONS** in §140.3(c).*

A. Minimum Skylight Area for Large Enclosed Spaces

1. Enter the reference page number from the building plans which reference the information for large enclosed spaces.
2. Enter the reference page number from the building plans which references the daylit zone designs on the plans attach a separate daylit zone design plan with this form, NRCC-ENV-04-E.

B. Calculating Daylit Zone

The minimum Skylit Zone requirements can be met by using either Skylit Daylit Zones or Primary Sidelit Daylit Zones or Combinations.

Step 1

1. Enter the floor area of the conditioned or unconditioned enclosed space next to A.
2. First calculate the minimum prescriptively required total daylit area. Additional information can be found on the Nonresidential Compliance Manual examples or see §140.3(c)1 & §130.1(d)1A. Use Equation $0.75 \times \text{Floor Area (A1.)} - \text{area of any permanent obstructions}$. Enter value in B2.

Step 2

3. Calculate the Skylit Daylit Zone Area (C3.) in accordance with §130.1(d)1A and shown on the building plans. Enter the Skylit Daylit Zone Area value in (C3.).
 - **SKYLIT DAYLIT ZONE area** is the rough area in plan view under each skylight, plus 0.7 times the average ceiling height in each direction from the edge of the rough opening of the skylight, minus any area on a plan beyond a permanent obstruction that is taller than the following: A permanent obstruction that is taller than one-half the distance from the floor to the bottom of the skylight. The bottom of the skylight is measured from the bottom of the skylight well for skylights having wells, or the bottom of the skylight if no skylight well exists. For the purpose of determining the skylit daylit zone, the geometric shape of the skylit daylit zone shall be identical to the plan view geometric shape of the rough opening of the skylight; for example, for a rectangular skylight the skylit daylit zone plan area shall be rectangular, and for a circular skylight the skylit daylit zone plan area shall be circular.
4. Calculate the Primary Sidelit Daylit Zone area (D4.) in accordance with §130.1(d)1B. Enter the Skylit Daylit Zone Area value in (C4.).
 - **PRIMARY SIDELIT DAYLIT ZONE** is the area on a plan directly adjacent to each vertical glazing, one window head height deep into the area, and window width plus 0.5 times window head height wide on each side of the rough opening of the window, minus any area on a plan beyond a permanent obstruction that is 6 feet or taller as measured from the floor.
5. Calculate or measure the overlap area of the Primary Sidelit Daylit Zone Area with the Skylit Daylit Zone Area and enter the Overlap Zone Area in (B5.)
6. Calculate the Daylit Zone Area by using equation $F = C + D - E$ and enter the Total Daylit Zone Area.

C. Compare Daylit Area Zone

Step 1

1. Here we compare if the Total Daylit Zone Area (F) is ≥ than Minimum Prescriptively Required Daylit Zone Area (B). If $F \geq B$ then compliance is met with the Total Daylit Zone Area.

FENESTRATION CERTIFICATE LABEL

CEC-NRCC-ENV-05-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-ENV-05-E
Fenestration Certificate Label	(Page 1 of 2)
Project Name:	Date Prepared:

This form is only used when an NFRC Label Certificate is not available. A separate (NCR-ENV-05-E formally FC-1) Label Certificate Form is required for each different fenestration product or different types of Fenestration.

*Method 1: For buildings with **less** than 1,000 ft² of site-built fenestration may optionally use either CEC Default Tables 110.6-A and 110.6-B, **Method 1**, or the Alternative Calculation Nonresidential Reference Appendix NA6, **Method 2**. Enter the total U-factor_T, SHGC_T and VT_T (Optional) in the following boxes below.*

*Method 2: For buildings with **greater** 1,000 ft² of site-built fenestration without NFRC Label Certificate, only one option is available; use CEC Default Tables 110.6-A and 110.6-B. Use **Method 1** only below and enter the total U-factor_T, SHGC_T and VT_T in the following boxes below.*

A. GENERAL INFORMATION

1	Climate Zone:		
2	Total Number of like Fenestration products:		
3	Total square footage of like Fenestration:		

B. METHOD 1

U-FACTOR INFORMATION from default, See TABLE 110.6-A

1	Frame Type:	<input type="checkbox"/> Metal	<input type="checkbox"/> Metal With Thermal Break	<input type="checkbox"/> Nonmetal
2	Product Type:	<input type="checkbox"/> Operable	<input type="checkbox"/> Fixed	<input type="checkbox"/> Greenhouse/Garden Window
3	Glazing Type:	<input type="checkbox"/> Single Pane	<input type="checkbox"/> Double Pane	<input type="checkbox"/> Glass Block
4	Enter the appropriate value from Table 110.6-A			
				U-factor_T =

SOLAR HEAT GAIN COEFFICIENT INFORMATION from default, See TABLE 110.6-B

5	Product Type:	<input type="checkbox"/> Operable	<input type="checkbox"/> Fixed	
6	Glazing:	<input type="checkbox"/> Clear	<input type="checkbox"/> Tinted	
7	Enter the appropriate value from Table 110.6-B			
				SHGC_T =

VISIBLE TRANSMITTANCE from Reference Nonresidential Appendix NA6

8	Product Type:	<input type="checkbox"/> Casement/Awning <input type="checkbox"/> Sliding <input type="checkbox"/> Fixed	<input type="checkbox"/> Curtainwall/Storefront/Site-built Manufactured Skylights(Non-curb mounted)	<input type="checkbox"/> Skylights Manufactured (Curb Mounted)
9	Enter Center-of-Glass for VT _C value:			
				VT_C =
10	Calculate VT _T = VT _F x VT _C (See Equation NA6-3)			
				VT_T =

C. METHOD 2

Alternative Calculation Nonresidential Reference Appendix NA6

NA6 Default Calculation - Enter Center of Glass (COG) value from Manufacturer's Documentation below:

Calculated Values

1	STEP 1: Enter Center-of-Glass for U-factor _C or the U _C value:		4	STEP 4: U-factor _T = C ₁ + (C ₂ X U _C)	U-factor_T =
2	STEP 2: Enter Center-of-Glass for SHGC _C value:		5	STEP 5: SHGC _T = 0.08 + (0.86 x SHGC _C) (See Equation NA6-2)	SHGC_T =
3	STEP 3: Enter Center-of-Glass for VT _C value:		6	STEP 6: VT _T = VT _F x VT _C (See Equation NA6-3)	VT_T =

D. ATTACHED MANUFACTURER'S LITERATURE

1	Manufacturer's literature must match the Product Type, Frame Type, Glazing, Center-of- Glass (COG) U-factor _C , SHGC _C and VT _C information needed to calculate the Default U-factor _T , SHGC _T , and VT _T .
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FENESTRATION CERTIFICATE LABEL

CEC-NRCC-ENV-05-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-ENV-05-E
Fenestration Certificate Label	(Page 2 of 2)
Project Name:	Date Prepared:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

California Energy Commission Default U-Factor and SHGC Label Certificate

This form is used when no NFRC Label Certificate is available for the specified fenestration product to be installed. Two options are allowed when no NFRC certificate is available. Method 1: For site-built fenestration of 1,000 square feet and greater use the Energy Commission's Default Table 110.6-A and Table 110.6-B in §110.6 of the Standards or Method 2: Use the Alternative Calculation found in the Reference Nonresidential Appendix NA6 for buildings with less than 1,000 ft² of glass, this includes skylights. Use the appropriate Method to determine the Total U-factor, SHGC and VT.

Note: NRCC-ENV-05-E formerly FC-1 is now simplified and combined together as one form.

Instructions to NRCC-ENV-05-E

A. GENERAL INFORMATION

1. Enter the Climate Zone in where the fenestration is being installed
2. Enter the total number of like fenestration products. Note that all unlike fenestration products will require a separate NRCC-ENV-05-E.
3. Enter total square footage of like Fenestration. Note this should match the surface area indicated in NRCC-ENV-01-E for each different Tag/ID.

B. METHOD 1

For buildings with **less** than 1,000 ft² of site-built fenestration may optionally use either CEC Default Tables 110.6-A and 110.6-B, use Method 1; Or the Alternative Calculation Nonresidential Reference Appendix NA6, Method 2.

Alternatively when buildings with **greater** 1,000 ft² of site-built fenestration without NFRC Label Certificate, only one option is available; use CEC Default Tables 110.6-A and 110.6-B use Method 1 only.

U-FACTOR INFORMATION

1. **Frame Type:** Select the appropriate frame type of the product being installed; Metal, Metal with Thermal Break and Nonmetal. Documentation from the manufacture must indicate the use of Metal with Thermal Break for each Tag/ID identified and should be attached to this NRCC-ENV-05-E form.
2. **Product Type:** Select the appropriate product type of the product being installed; Operable, Fixed, Greenhouse/Garden Window, Doors, and Skylight.
3. **Glazing Type:** Select the appropriate glazing type of the product being installed; either Operable or Fixed
4. Enter the appropriate value from Table 110.6-A. This value must match on what has been selected in item B.1, B.2, and B.3.

SOLAR HEAT GAIN COEFFICIENT INFORMATION

5. Product Type: Select either Operable or Fixed. The selection should match the liked fenestration and Tag/ID
6. Glazing: Select either Clear or Tinted. The selection should match the liked fenestration and Tag/ID
7. Enter the appropriate value from Table 110.6-B. This value must match on what has been selected in item B.5, and B.6.

VISIBLE TRANSMITTANCE

8. **Product Type:** Select the appropriate product type of the product being installed; Casement/Awning, sliding, fixed, curtainwall/storefront/site-built or Manufactured Skylights without curb mounting or skylights with curb mounting.
9. From the manufactures literature or specifications enter the center-of-glass, VT_C.
10. Use equation NA6-3, select the appropriate VT_F and calculate VT_{Total}

C. METHOD 2

For buildings with **less** than 1,000 ft² of site-built fenestration may optionally use **Method 1**.

1. Follow Step 1 and Enter Center-of-Glass for U-factor_C or the U_C value:
2. Follow Step 2 and Enter Center-of-Glass for SHGC_C.
3. Follow Step 3 and Enter Center-of-Glass for VT_C:
4. Calculate the Total U-factor by using Equation NA6-1 and use Table NA6-5 for C1 and C2 values. In addition use Step 1 (U_C) value in the equation and calculate U-factor_{Total}.
5. Calculate the Total SHGC by using equation NA6-2 and use Step 2 (SHGC_C) value in the equation and then calculate the value for SHGC_{Total}.
6. Calculate the Total VT by using equation NA6-3 and use Step 3 (VT_C) value in the equation and then calculate the value for VT_{Total}.

D. ATTACHED MANUFACTURER'S LITERATURE

1. Manufacturer's literature must be match the Product Type, Frame Type, Glazing, Center-of- Glass (COG) U-factor_C, SHGC_C and VT_C information needed to calculate Method 1 or Method 2.

AREA WEIGHTED AVERAGE CALCULATION WORKSHEET

CEC-NRCC-ENV-06-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-ENV-06-E
Area Weighted Average Calculation Worksheet		(Page 1 of 2)
Project Name:	Date	

This worksheet is used to calculate the area weighted-average values for a building envelope features such as, walls, roofs, floors, mass, and fenestration/glazing U-factors, Relative Solar Heat Gain Coefficient (RSHGC) or Visible Transmittance (VT) for the prescriptive compliance approach. R-values can never be area weighted averaged. Only U-factors, SHGC, RSHGC or VT can be used. When a window has an overhang, calculate the RSHGC first (see Equation 140.3-A), then determine the weighted average if need be.

Weighted averaging is used when there is more than one level of insulation or more than one type of window and one or more type of fenestration which would not meet prescriptive compliance requirements. Each fenestration type (e.g., vertical windows, skylights, dynamic glazing, and window films) are treated independently or cannot be combined. Weight averaging is not allowed for chromogenic glazing.

A. Area Weighted Average Calculation														
Item/ Tag No.	Type 1 Value ¹		Type 1 Area ²		Type 2 Value ¹		Type 2 Area ²		Type 3 Value ¹		Type 3 Area ²		Total Area	Area Weighted Average Value ³
	[()]	x	()	+	()	x	()	+	()	x	()	÷		=
	[()]	x	()	+	()	x	()	+	()	x	()	÷		=
	[()]	x	()	+	()	x	()	+	()	x	()	÷		=
	[()]	x	()	+	()	x	()	+	()	x	()	÷		=
	[()]	x	()	+	()	x	()	+	()	x	()	÷		=
	[()]	x	()	+	()	x	()	+	()	x	()	÷		=

1. "Value" can be replaced throughout the formula by "U-factor", "Relative Solar Heat Gain Coefficient, Visible Transmittance" or any other value that varies throughout Nonresidential and is appropriate to weight average. Mixture of different units not allowed.
2. "Area" can be replaced throughout the formula by "Length" or any other unit of measure used for the value being averaged. Mixture of different units not allowed.
3. Enter the above Weighted Average Value on the NRCC-ENV-01-E and NRCC-ENV-02-E form and attach this sheet.

AREA WEIGHTED AVERAGE CALCULATION WORKSHEET

CEC-NRCC-ENV-06-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-ENV-06-E
Area Weighted Average Calculation Worksheet	(Page 2 of 2)
Project Name:	Date:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	NRCC-ENV-06-E
Area Weighted Average Calculation Worksheet	(Page 1 of 1)

WKS-02 Prescriptive Instructions

General Information:

Project Name: Identifying information, such as owner's name.

Date: Date of document preparation.

A. Area Weighted Average Calculation

1. Tag/ID: A label (if any) should match from the plans or energy forms, such as Window -1 or Wall-1.
2. Type 1 Value: U-factor, RSHGC or VT value of the first component from the manufacturers data or specification sheet
3. Type 1 Area: Area value (wall surface area or window rough opening); plus
4. Type 2 Value: U-factor, RSHGC or VT value of the second component from the manufacturers data or specification sheet
5. Type 2 Area: Area value (wall surface area or window rough opening); plus
6. Type 3 Value: U-factor, RSHGC or VT value of the third component from the manufacturers data or specification sheet
7. Type 3 Area: Area value (wall surface area or window rough opening); Sum all Types and divided by

Note: if more than three component s then use the next line and use the total area of both lines and divide into the summation of the other values.

8. Total Area: Is the sum of all the area of the walls or windows
9. Area Weighted Average Value: The new calculated U-factor, RSHGC or VT value is entered on the respective prescriptive NRCC-ENV-01-E and NRCC-ENV-02-E form.

INDOOR LIGHTING

CEC-NRCC-LTI-01-E (Revised 06/13)

**CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS**

NRCC-LTI-01-E

Indoor Lighting

(Page 1 of 5)

Project Name:

Date Prepared:

Climate Zone:	Conditioned Floor Area :
	Unconditioned Floor Area :

General Information

Building Type:	<input type="checkbox"/> Nonresidential	<input type="checkbox"/> High-Rise Residential	<input type="checkbox"/> Hotel/Motel
<input type="checkbox"/> Schools	<input type="checkbox"/> Relocatable Public Schools	<input type="checkbox"/> Conditioned Spaces	<input type="checkbox"/> Unconditioned Spaces
Phase of Construction:	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration
Method of Compliance:	<input type="checkbox"/> Complete Building	<input type="checkbox"/> Area Category	<input type="checkbox"/> Tailored

LIGHTING COMPLIANCE DOCUMENTS (select yes for each document included)			
<i>For detailed instructions on the use of this and all Energy Efficiency Standards compliance documents, refer to the Nonresidential Manual published by the California Energy Commission.</i>			
YES	NO	FORM	TITLE
		NRCC-LIT-01-E	Certificate of Compliance. All Pages required on plans for all submittals.
		NRCC-LIT-02-E	Lighting Controls, Certificate of Compliance, and PAF Calculation. All Pages required on plans for all submittals.
		NRCC-LIT-03-E	Indoor Lighting Power Allowance
		NRCC-LIT-04-E	Tailored Method Worksheets
		NRCC-LIT-05-E	Line Voltage Track Lighting Worksheets

Summary of Allowed Lighting Power					
Conditioned and Unconditioned space Lighting must not be combined for compliance					
Indoor Lighting Power for Conditioned Spaces				Indoor Lighting Power for Unconditioned Spaces	
	Installed Lighting NRCC-LTI-01-E, page 4	Watts		Installed Lighting NRCC-LTI-01-E, page 4	Watts
1.		+			
2.	PORTABLE ONLY FOR OFFICES NRCC-LTI-01-E, page 3	+			
3.	Minus Lighting Control Credits NRCC-LTI-01-E, page 2	-		Minus Lighting Control Credits NRCC-LTI-01-E, page 2	-
4.	Adjusted Installed Lighting Power (row 1 plus row 2 minus row 3)	=		Adjusted Installed Lighting Power (row 1 minus row 3)	=

INDOOR LIGHTING

CEC-NRCC-LTI-01-E (Revised 06/13)

**CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS**

NRCC-LTI-01-E

Indoor Lighting

(Page 2 of 5)

Project Name:

Date Prepared:

5.	Complies ONLY if Installed ≤ Allowed		Complies ONLY if Installed ≤ Allowed	
6.	Allowed Lighting Power Conditioned NRCC-LTI-03-E, page 1		Allowed Lighting Power Unconditioned NRCC-LTI-03-E, page 1	

Declaration of Required Installation Certificates – Declare by selecting yes for all Installation Certificates that will be submitted. (Retain copies and verify forms are completed and signed.)

YES	NO	Form/Title	
		NRCI-LTI-01-E - Must be submitted for all buildings	<input type="checkbox"/> Field Inspector
		NRCI-LTI-02-E - Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS), to be recognized for compliance.	<input type="checkbox"/> Field Inspector
		NRCI-LTI-03-E - Must be submitted for a line-voltage track lighting integral current limiter, or for a supplementary overcurrent protection panel used to energize only line-voltage track lighting, to be recognized for compliance.	<input type="checkbox"/> Field Inspector
		NRCI-LTI-04-E - Must be submitted for two interlocked systems serving an auditorium, a convention center, a conference room, a multipurpose room, or a theater to be recognized for compliance.	<input type="checkbox"/> Field Inspector
		NRCI-LTI-05-E - Must be submitted for a Power Adjustment Factor (PAF) to be recognized for compliance.	<input type="checkbox"/> Field Inspector
		NRCI-LTI-06-E - Must be submitted for additional wattage installed in a video conferencing studio to be recognized for compliance.	<input type="checkbox"/> Field Inspector

Declaration of Required Certificates of Acceptance – Declare by checking all of the Certificates of Acceptance that will be submitted. (Retain copies and verify forms are completed and signed.)

YES	NO	Form/Title	
		NRCA-LTI-02-E - Must be submitted for occupancy sensors and automatic time switch controls.	<input type="checkbox"/> Field Inspector
		NRCA-LTI-03-E - Must be submitted for automatic daylight controls.	<input type="checkbox"/> Field Inspector
		NRCA-LTI-04-E - Must be submitted for demand responsive lighting controls.	<input type="checkbox"/> Field Inspector

INDOOR LIGHTING

CEC-NRCC-LTI-01-E (Revised 06/13)

**CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS**

NRCC-LTI-01-E

Indoor Lighting

(Page 3 of 5)

Project Name:

Date Prepared:

A separate Lighting Schedule Must Be Filled Out for Conditioned and Unconditioned Spaces. Installed Lighting Power listed on this Lighting Schedule is only for:

☐ **CONDITIONED SPACE** ☐ **UNCONDITIONED SPACE**

A. INDOOR LIGHTING SCHEDULE and FIELD INSPECTION ENERGY CHECKLIST

- ☐ The actual indoor lighting power listed on this page and on the next page includes all installed permanent and planned portable lighting systems.
- ☐ When Complete Building Method is used for compliance, list each different type of luminaire on separate lines.
- ☐ When Area Category Method or Tailored Method is used for compliance, list each different type of luminaire by each different function area on separate lines
- ☐ Also include track lighting in schedule, and submit the track lighting compliance form (LTG-5C) when line-voltage track lighting is installed.

B. Installed Portable Luminaires in Offices – Exception to Section 140.6(a)

- ☐ This section shall be filled out ONLY for portable luminaires in offices (As defined in §100.1). All other planned portable luminaires shall be documented on next page of this compliance form.
- ☐ This section is used to determine if greater than 0.3 watts of portable lighting is planned for any office
- ☐ Fill out a separate line for each different office. Small offices that are typical (having the same general and portable lighting) may be grouped together. This allowance shall not be traded between offices having different lighting systems.

Office Portable Luminaire Schedule	Office Installed Portable Luminaire Watts Per Square Foot						Accountabl e Watts	Office Location	Field Inspector	
A	B	C	D	E	F	G	H	I	J	
Complete Luminaire Description (i.e., LED, under cabinet, furniture mounted direct/indirect)	Watts per Luminaire	Number of Luminaires	Installed portable luminaire watts in this office (B x C)	Square feet of this office	Watts per square foot (D / E)	If F ≤ 0.3, enter zero; if F > 0.3, (F-0.3)	E x G	Identify Office area in which these portable luminaires are installed	Pass	Fail
									<input type="checkbox"/>	<input type="checkbox"/>
									<input type="checkbox"/>	<input type="checkbox"/>
									<input type="checkbox"/>	<input type="checkbox"/>
									<input type="checkbox"/>	<input type="checkbox"/>
									<input type="checkbox"/>	<input type="checkbox"/>
Total installed portable luminaire watts that are greater than 0.3 watts per square foot per office:								Enter sum total of all pages into NRCC-LTI-01-E; Page 2		

INDOOR LIGHTING

CEC-NRCC-LTI-01-E (Revised 06/13)

**CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS**

NRCC-LTI-01-E

Indoor Lighting

(Page 4 of 5)

Project Name:

Date Prepared:

A separate Lighting Schedule Must Be Filled Out for Conditioned and Unconditioned Spaces. Installed Lighting Power listed on this Lighting Schedule is only for:

☐ **CONDITIONED SPACE** ☐ **UNCONDITIONED SPACE**

C. INDOOR LIGHTING SCHEDULE and FIELD INSPECTION ENERGY CHECKLIST									
Luminaire Schedule		Installed Watts				Location	Field Inspector ¹		
A	B	C	D		E	F	G	H	
Name or Item Tag	Complete Luminaire Description (i.e, 3 lamp fluorescent troffer, F32T8, one dimmable electronic ballast)	Watts per Luminaire	How wattage was determined		Number of Luminaires	Total Installed Watts in this area (C x E)	Primary Function area in which these luminaires are installed	Pass	Fail
			CEC Default from NA8	According to §130.0(c)					
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
INSTALLED WATTS PAGE TOTAL:							Enter sum total of all pages into NRCC-LTI-01-E; Page 2		

INDOOR LIGHTING

CEC-NRCC-LTI-01-E (Revised 06/13)

**CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS**

NRCC-LTI-01-E

Indoor Lighting

(Page 5 of 5)

Project Name:

Date Prepared:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

INDOOR LIGHTING – LIGHTING CONTROLS

CEC-NRCC-LTI-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-LTI-02-E
Indoor Lighting - Lighting Controls		(Page 1 of 5)
Project Name:	Date Prepared:	

The NRCC-LTI-02-E shall be used to document all mandatory and prescriptive lighting controls that are applicable to the project.

A. Mandatory Lighting Control Declaration Statements Indicate if the measure applies:		
YES	NO	Control Requirements
		Lighting shall be controlled by self-contained lighting control devices which are certified to the Energy Commission according to the Title 20 Appliance Efficiency Regulations in accordance with Section 110.9.
		Lighting shall be controlled by a lighting control a system or energy management control system in accordance with §110.9. An Installation Certificate shall be submitted in accordance with Section 130.4(b).
		One or more Track Lighting Integral Current Limiters shall be installed which have been certified to the Energy Commission in accordance with §110.9 and §130.0. An Installation Certificate shall be submitted in accordance with Section 130.4(b).
		A Track Lighting Supplementary Overcurrent Protection Panel shall be installed in accordance with Section 110.9 and Section 130.3. Additionally, an Installation Certificate shall be installed in accordance with Section 130.4(b).
		All lighting controls and equipment shall comply with the applicable requirements in §110.9 and shall be installed in accordance with the manufacturer's instructions in accordance with Section 130.1.
		All luminaires shall be functionally controlled with manually switched ON and OFF lighting controls in accordance with Section 130.1(a).
		General lighting shall be separately controlled from all other lighting systems in an area. Floor and wall display, window display, case display, ornamental, and special effects lighting shall each be separately controlled on circuits that are 20 amps or less. When track lighting is used, general, display, ornamental, and special effects lighting shall each be separately controlled; in accordance with Section 130.0(a)4.
		The general lighting of any enclosed area 100 square feet or larger, with a connected lighting load that exceeds 0.5 watts per square foot shall meet the multi-level lighting control requirements in accordance with Section 130.1(b).
		All installed indoor lighting shall be equipped with controls that meet the applicable Shut-OFF control requirements in Section 130.1(c).
		Lighting in all Daylit Zones shall be controlled in accordance with the requirements in Section 130.1(d) and daylit zones are shown on the plans.
		Lighting power in buildings larger than 10,000 square feet shall be capable of being automatically reduced in response to a Demand Responsive Signal in accordance with Section 130.1(e).

INDOOR LIGHTING – LIGHTING CONTROLS

CEC-NRCC-LTI-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-LTI-02-E
Indoor Lighting - Lighting Controls		(Page 2 of 5)
Project Name:	Date Prepared:	

		Before an occupancy permit is granted for a newly constructed building or area, or a new lighting system serving a building, area, or site is operated for normal use, indoor lighting controls serving the building, area, or site shall be certified as meeting the Acceptance Requirements for Code Compliance in accordance with Section 130.4.(a). The controls required to meet the Acceptance Requirements include automatic daylight controls, automatic shut-OFF controls, and demand responsive controls.
--	--	---

A separate document must be filled out for Conditioned and Unconditioned Spaces. This page is used only for the following: <input type="checkbox"/> CONDITIONED SPACES <input type="checkbox"/> UNCONDITIONED SPACES	
---	--

MANDATORY AND PRESCRIPTIVE INDOOR LIGHTING CONTROL SCHEDULE, PAF CALCULATION, and FIELD INSPECTION CHECKLIST															
Lighting Control Schedule			Standards Complying With ¹ (✓ all that apply, or enter 'E' if Exempted)							PAF Credit Calculation ²			✓ if Acceptance Test Required	Field Inspector	
										Watts of Controlled Lighting	PAF	Control Credit (K x L)			
A	B	C	D	E	F	G	H	I	J	K	L	M	N	Pass	Fail
Location in Building	Type/ Description of Lighting Control (i.e.: occupancy sensor, automatic time switch, dimmer, automatic daylight, etc...)	# of Units	§130.1(a)	§130.0(b)	§130.1(c)	§130.1(d)	§130.1(e)	§140.6(a)2	§140.6(d)						
														<input type="checkbox"/>	<input type="checkbox"/>
														<input type="checkbox"/>	<input type="checkbox"/>
														<input type="checkbox"/>	<input type="checkbox"/>
														<input type="checkbox"/>	<input type="checkbox"/>
														<input type="checkbox"/>	<input type="checkbox"/>
														<input type="checkbox"/>	<input type="checkbox"/>
														<input type="checkbox"/>	<input type="checkbox"/>
														<input type="checkbox"/>	<input type="checkbox"/>

Registration Number:

Registration Date/Time:

HERS Provider:

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance

June 2013



NRCC-LTI-02-E

(Page 3 of 5)

Date Prepared:

IF MULTIPLE PAGES ARE USED, ENTER SUM TOTAL OF ALL PAGES HERE:

1. §130.1(a) = Manual area controls; §130.0(b) = Multi Level; §130.1(c) = Auto Shut-Off; §130.1(d) = Mandatory Daylight; §130.1(e) = Demand Responsive; §140.6(d) = Additional lighting controls installed to earn a PAF; §140.6(d) = Prescriptive Secondary Sidelit Daylight Controls.

2. Check Table 140.6-A for correct Factor. PAFs shall not be traded between conditioned and unconditioned spaces. As a condition to earn a PAF, an Installation Certificate is also required to be filled out, signed, and submitted.

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Signature:

Signature	Date:
-----------	-------

CEA/ HERS Certification Identification (if applicable):

Phone:

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Signature:

Date Signed:

License:	
----------	--

Phone:	
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INDOOR LIGHTING POWER ALLOWANCE

CEC-NRCC-LTI-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-LTI-03-E
Certificate of Compliance - Indoor Lighting Power Allowance		(Page 1 of 4)
Project Name:	Date Prepared:	

LOWED LIGHTING POWER (Chose Method)	
A separate page must be filled out for Conditioned and Unconditioned Spaces. This page is only for:	
<input type="checkbox"/> CONDITIONED spaces	<input type="checkbox"/> UNCONDITIONED spaces

A. SUMMARY TOTALS OF LIGHTING POWER ALLOWANCES		
<input type="checkbox"/> If using Complete Building Method for compliance, use only the total in column (a) as total allowed building watts. <input type="checkbox"/> If using Area Category Method, Tailored Method, or a combination of Area Category and Tailored Method for compliance, use only the total in column (b) as the total allowed building watts		
	(a)	(b)
1. Complete Building Method Allowed Watts. Documented in section B of NRCC-LTI-03-E (below on this page)		
2. Area Category Method Allowed Watts. Documented in section C-1 of NRCC-LTI-03-E (below on this page)		
3. Tailored Method Allowed Watts. Documented in section A of NRCC-LTI-04-E		
TOTAL ALLOWED BUILDING WATTS. Enter number into correct cell on NRCC-LTI-01, Page 2, Row 1		
<input type="checkbox"/> Check here if building contains both conditioned and unconditioned areas.		

B. COMPLETE BUILDING METHOD LIGHTING POWER ALLOWANCE						
A		B		C		D
TYPE OF BUILDING (From §140.6 Table 140.6-B)		WATTS PER (ft ²)	X	COMPLETE BLDG. AREA	=	ALLOWED WATTS
Total Area:						
Total Watts. Enter Total Watts into section A, row 1 (Above on this page)						

C -1 AREA CATEGORY METHOD TOTAL LIGHTING POWER ALLOWANCES (C-2 plus C-3)	Watts
Total from section C-2 .	
Total from section C-3 .	



NRCC-LTI-03-E

(Page 2 of 4)

Date Prepared:

• **What is the purpose of the study?**

□ **CONDITIONED** spaces □ **UNCONDITIONED** spaces

- ☐ Do not include portable lighting for offices. Portable lighting for offices shall be documented only in section B of NRCC-LTI-01-E.
- ☐ Separately list lighting for each primary function area as defined in §100.1 of the Standards.

[illegible]

HERS Provider:



NRCC-LTI-03-E

(Page 3 of 4)

Date Prepared:

TOTALS				
Enter sum total Area Category allowed watts into section C-1 of NRCC-LTI-03-E (this compliance form)				
				WATTS
A separate page must be filled out for Conditioned and Unconditioned Spaces. This page is only for: <input type="checkbox"/> CONDITIONED spaces <input type="checkbox"/> UNCONDITIONED spaces				

C-2	AREA CATEGORY METHOD	Additional Lighting Wattage Allowance (from Table 140.6-C Footnotes)
-----	----------------------	--

[illegible]

HERS Provider:

INDOOR LIGHTING POWER ALLOWANCE

CEC-NRCC-LTI-03-E (Revised 06/13)



CERTIFICATE OF COMPLIANCE		NRCC-LTI-03-E
Certificate of Compliance - Indoor Lighting Power Allowance		(Page 4 of 4)
Project Name:	Date Prepared:	

1. Use linear feet only for additional allowance for white board or chalk board. All other additional Area Category allowances shall use watts per square foot.
2. Additional watts are available only when allowed according to the footnotes on bottom of Table 146-C, which include: Specialized task work; Ornamental lighting; Precision commercial and industrial work; Per linear foot of white board or chalk board; Accent, display and feature lighting; and Videoconferencing Studio lighting..
3. Luminaire classification and wattage shall be determined in accordance with §130.0(c) of the Standards.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

CERTIFICATE OF COMPLIANCE		NRCC-LTI-04-E
Indoor Lighting – Tailored Method		(Page 1 of 7)
Project Name:	Date Prepared:	

Complete separate documents for Conditioned and Unconditioned Spaces.

This page is used to document: ☐ **CONDITIONED SPACES** ☐ **UNCONDITIONED SPACES**

A. TAILORED METHOD LIGHTING POWER ALLOWANCE SUMMARY

1. General lighting power (Building Total from Section B of NRCC-LTI-04-E)	1.																						
2. General lighting power special function areas (Building Total from Section C of NRCC-LTI-04-E)	2.																						
3. Additional “use it or lose it” lighting power (Watts listed in each of these cells shall be identical to total allowed watts determined in Section D of NRCC-LTI-04-E.																							
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center; padding: 5px;">Wall Display from Section D-1</td> <td style="width: 5%;"></td> <td style="width: 20%; text-align: center; padding: 5px;">Combined Floor Display and Task Lighting from Section D-2</td> <td style="width: 5%;"></td> <td style="width: 20%; text-align: center; padding: 5px;">Combined Ornamental and Special Effects Lighting from Section D-3</td> <td style="width: 5%;"></td> <td style="width: 20%; text-align: center; padding: 5px;">Very Valuable Merchandise from Section D-4</td> </tr> <tr> <td style="border-top: 1px solid black;"></td> <td style="text-align: center; border-top: 1px solid black;">+</td> <td style="border-top: 1px solid black;"></td> <td style="text-align: center; border-top: 1px solid black;">+</td> <td style="border-top: 1px solid black;"></td> <td style="text-align: center; border-top: 1px solid black;">+</td> <td style="border-top: 1px solid black;"></td> </tr> <tr> <td colspan="6"></td> <td style="text-align: center; padding: 5px;">=</td> </tr> </table>	Wall Display from Section D-1		Combined Floor Display and Task Lighting from Section D-2		Combined Ornamental and Special Effects Lighting from Section D-3		Very Valuable Merchandise from Section D-4		+		+		+								=		
Wall Display from Section D-1		Combined Floor Display and Task Lighting from Section D-2		Combined Ornamental and Special Effects Lighting from Section D-3		Very Valuable Merchandise from Section D-4																	
	+		+		+																		
						=																	
4. Total Allowed Watts using Tailored Method (add lines 1, 2 and 3)	4.																						

B. TAILORED METHOD ALLOWED GENERAL LIGHTING POWER FROM TABLE 140.6-D

A	B	C	D	E	F	G
ROOM NUMBER	PRIMARY FUNCTION AREA	ILLUMINANCE VALUE (LUX)	ROOM CAVITY RATIO	ALLOWED LPD	FLOOR AREA	ALLOWED WATTS (E x F)
PAGE TOTAL						
If multiple pages are used, enter building total here						

C. TAILORED METHOD ALLOWED GENERAL LIGHTING POWER FOR SPECIAL FUNCTION AREAS ACCORDING TO § 140.6(c)3H

☐ This section shall be used to determine allowed general lighting power **ONLY** for the following primary function areas: Exercise Center, Gymnasium; Medical and Clinical Care; Police Stations and Fire Stations; Public rest areas along state and federal roadways; other primary function areas that are not listed in Table 140.6-D

A	B	C	D	E	F	G
ROOM NUMBER	PRIMARY FUNCTION AREA	ILLUMINANCE VALUE (LUX)	ROOM CAVITY RATIO	ALLOWED LPD	FLOOR AREA	ALLOWED WATTS (E x F)
PAGE TOTAL						
If multiple pages are used, enter building total here						

Project Name:

Date Prepared:

Complete separate documents for Conditioned and Unconditioned Spaces.

This page is used to document: ☐ CONDITIONED SPACES ☐ UNCONDITIONED SPACES

D. TAILORED METHOD ADDITIONAL “USE IT OR LOSE IT” LIGHTING POWER ALLOWANCES

- ☐ Use this section to document and calculate additional lighting power for wall display, floor display, task, ornamental, special effects, or very valuable display case lighting.
- ☐ The additional lighting power allowance shall be the smaller of the allowed lighting power or the actual lighting power used.
- ☐ These additional lighting power allowances shall not be available when using §140.6(c)3H to determine the general lighting power allowance, when using the Complete Building Method, or for any areas using the Area Category Method.

D-1. Additional allowed lighting power for wall display lighting

- ☐ Floor displays shall not qualify for the wall display lighting power allowance.
- ☐ Qualifying wall lighting complies with the applicable requirements in §140.6(c)3I.

A	B	C	D	E	F	G	H	I	J	K
Primary Function Area	ALLOTTED WATTS			DESIGN WATTS						
	Wall Display Length in (Linear Feet)	Wall Display Power (W/lin foot)	Allotted Watts (B x C)	Luminaire Code	Mounting Height	Mounting height factor	Watts per luminaire	# luminaires	Design Watts (G x H x I)	Allowed Watts (smaller of D or J)
					< 12 feet	1.00				
					12 feet to < 16 feet	0.87				
					16 feet or higher	0.77				
				Total for this Primary Function Area:						
					< 12 feet	1.00				
					12 feet to < 16 feet	0.87				
					16 feet or higher	0.77				
				Total for this Primary Function Area:						
					< 12 feet	1.00				
					12 feet to < 16 feet	0.87				
					16 feet or higher	0.77				
				Total for this Primary Function Area:						
					< 12 feet	1.00				
					12 feet to < 16 feet	0.87				
					16 feet or higher	0.77				
				Total for this Primary Function Area:						
Sum total power for wall display lighting for all function areas:										

Project Name:

Date Prepared:

Complete separate documents for Conditioned and Unconditioned Spaces.

This page is used to document: ☐ CONDITIONED SPACES ☐ UNCONDITIONED SPACES

D-2. Additional allowed lighting power for combined floor display and task lighting

- ☐ Displays that are installed against a wall shall not qualify for the floor display lighting power allowances.
- ☐ Lighting internal to display cases shall be counted EITHER as floor display lighting in accordance with §140.6(c)3J; or as very valuable display case lighting in accordance with §140.6(c)3Liii and iv.
- ☐ Additional allowed power for floor display lighting, and additional allowed power for task lighting, may be used by qualifying floor display lighting systems, qualifying task lighting systems, or a combination of both. For floor areas qualifying for both floor display and task lighting power allowances, the additional allowed power shall be used only once for the same floor area, so that the allowance shall not be additive.
- ☐ Qualifying floor display lighting complies with the applicable provision in §140.6(c)3J(v and vi).
- ☐ Additional allowed power for a combination of floor display lighting and task lighting shall be available only for (I) floors having floor displays; or (II) floors not having floor displays but having tasks having illuminance recommendations that appear in the Tenth Edition of the IES Lighting Handbook and that are higher than the general lighting level in column 2 of TABLE 140.6-D. The square footage of floor display or the square footage of task areas shall be determined in accordance with §140.6(c)3C and D, except that any floor area designed to not have floor displays or tasks, such as floor areas designated as a path of egress, shall not be included for the floor display allowance.

A	B	C	D	E	F	G	H	I	J	K
Primary Function Area	ALLOTTED WATTS			DESIGN WATTS						
	Square feet of area	Lighting Power (W per sq ft)	Allotted Watts (B x C)	Luminaire Code	Mounting Height	Mounting height factor	Watts per luminaire	# luminaires	Design Watts (G x H x I)	Allowed Watts (smaller of D or J)
					< 12 feet	1.00				
					12 feet to < 16 feet	0.87				
					16 feet or higher	0.77				
Total for this Primary Function Area:										
					< 12 feet	1.00				
					12 feet to < 16 feet	0.87				
					16 feet or higher	0.77				
				Total for this Primary Function Area:						
					< 12 feet	1.00				
					12 feet to < 16 feet	0.87				
					16 feet or higher	0.77				
				Total for this Primary Function Area:						
Sum total power for wall display lighting:										

Project Name:

Date Prepared:

Complete separate documents for Conditioned and Unconditioned Spaces.

This page is used to document: ☐ CONDITIONED SPACES ☐ UNCONDITIONED SPACES

D-3. Additional allowed lighting power for combined ornamental and special effects

- ☐ Qualifying ornamental lighting includes luminaires such as chandeliers, sconces, lanterns, neon and cold cathode, light emitting diodes, theatrical projectors, moving lights, and light color panels when any of those lights are used in a decorative manner that does not serve as display lighting or general lighting.
- ☐ Special effects lighting is defined as lighting installed to give off luminance instead of providing illuminance.
- ☐ There is no mounting height multiplier for ornamental or special effects lighting
- ☐ Additional allowed power for ornamental and special effects lighting may be used only for qualifying lighting systems. For floor areas qualifying for both ornamental and special effects lighting power allowances, the additional allowed power shall be used only once for the same floor area, so that the allowance shall not be additive.

A	B	C	D	E	F	G	H	I
Primary Function Area	ALLOTTED WATTS			DESIGN WATTS				Allowed Watts (smaller of D or Total for H)
	Square feet of area	Lighting Power (W per sq ft)	Allotted Watts (B x C)	Luminaire Code or Description (rows below accommodate 3 layers per function area)	Watts per luminaire	# luminaires	Design Watts (F X G)	
				1.				
				2.				
				3.				
				Total ornamental/special effects lighting for this primary function area:				
				1.				
				2.				
				3.				
				Total ornamental/special effects lighting for this primary function area:				
				1.				
				2.				
				3.				
				Total ornamental/special effects lighting for this primary function area:				
				1.				
				2.				
				3.				
				Total ornamental/special effects lighting for this primary function area:				
Sum total allowed watts for ornamental and special effects lighting:								

Project Name:

Date Prepared:

Complete separate documents for Conditioned and Unconditioned Spaces.

This page is used to document: ☐ CONDITIONED SPACES ☐ UNCONDITIONED SPACES

D-4. Additional allowed lighting power for very valuable display case lighting

- ☐ Lighting internal to display cases shall be counted EITHER as floor display lighting in accordance with §140.6(c)3J; or if qualifying, as very valuable display case lighting in accordance with §140.6(c)3Liii and iv.
- ☐ Case lighting is lighting of small art objects, artifacts, or valuable collections which involves customer inspection of very fine detail from outside of a glass enclosed display case.
- ☐ To qualify for this allowance, case shall contain jewelry, coins, fine china, fine crystal, precious stones, silver, smart art objects or artifacts, and/or valuable collections the display of which involves customer inspection of very fine detail from outside of a locked case.
- ☐ This allowance is available only for display cases in retail merchandise sales, museum, and religious worship areas.
- ☐ Any floor area designed to not have very valuable display case lighting shall not be included for this allowance.
- ☐ A mounting height multiplier is not available.

A	B	C	D	E	F	G	H	I	J
Primary Function Area	Description of display case	WATTS PER SQUARE FOOT OF QUALIFYING FLOOR AREA			WATTS PER SQUARE FOOT OF QUALIFYING DISPLAY CASE AREA			ACTUAL INSTALLED WATTS	ALLOWED WATTS IS SMALLEST OF E, H, or I
		Square feet of floor area	Allowed Watts per sq ft	Allotted Watts (C x D)	Square feet of display case	Allowed Watts per square foot	Allotted Watts (F x G)		
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
			0.8			12.0			
Sum total allowed watts for very valuable display case lighting:									

ROOM CAVITY RATIO (RCR) WORKSHEET

RECTANGULAR SPACES

A	B	C	D	E	F
Room Number	Task/Activity Description	Room Length (L) (ft)	Room Width (W) (ft)	Room Cavity Height (H) (ft)	RCR $5 \times H \times (L+W) / (L \times W)$

NON-RECTANGULAR SPACES

A	B	C	D	E	F
Room Number	Task/Activity Description	Room Area (A) (ft ²)	Room Perimeter (P) (ft)	Room Cavity Height (H) (ft)	RCR $2.5 \times H \times P / A$

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

LINE-VOLTAGE TRACK LIGHTING WORKSHEET

CEC-NRCC-LTI-05-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-LTI-05-E
Indoor Lighting – Line-Voltage Track Lighting Worksheet		(Page 1 of 2)
Project Name:	Date Prepared:	

- ☐ There are four different methods available for determining how many watts of line-voltage track or line-voltage busway has been installed. One or more methods may be used to determine how many watts of line-voltage track or line-voltage busway has been installed. Use this worksheet to separately calculate the input wattage for each system.
- ☐ Separately enter each row of this worksheet into the Luminaire Schedule in section C of NRCC-LTI-01-E
- ☐ Method 1 is the only option available for determining wattage for track or busway rated for more than 20 amperes

☐ **METHOD 1 – VOLT-AMPERE (VA) RATING OF THE BRANCH CIRCUIT(S)**

A	B
BRANCH CIRCUIT NAME OR ID	VOLT-AMPERE (VA) RATING OF THE BRANCH CIRCUIT

☐ **METHOD 2 – USE THE HIGHER OF 45 WATTS PER LINEAR FOOT OF TRACK OR TOTAL RATED WATTAGE OF ALL LUMINAIRES**

A	B	C	D	E	F
Track or Name #	Linear Feet of Track	(W/LF)	B x C (W)	TOTAL RATED WATTAGE OF ALL LUMINAIRES	LARGER OF (D or E)
		45			
		45			
		45			

☐ **METHOD 3 – USE THE HIGHER OF: 12.5 WATTS / LINEAR FOOT OF TRACK – OR VA RATING OF INTEGRAL CURRENT LIMITER**

- ☐ Only integral current limiters which are certified to the Energy Commission shall be recognized by the Standards.
- ☐ This method shall not be recognized if an Installation Certificate is not submitted.

A	B	C	D	E	F
Track or Name #	Linear Feet of Track	(W/LF)	B x C (W)	VA Rating of Integral Current Limiter	Larger of (D or E)
		12.5			
		12.5			
		12.5			

☐ **METHOD 4 - DEDICATED TRACK LIGHTING SUPPLEMENTARY OVERCURRENT PROTECTION PANEL**

- ☐ This method shall not be recognized if an Installation Certificate is not submitted.
- ☐ This method shall be used only for line-voltage track lighting, and shall not be recognized for any other lighting systems. If any other lighting systems or devices are installed, the supplementary overcurrent protection panel shall not be recognized for compliance with the Standards

A	B	C	D
NAME OR ID	Voltage of the Branch Circuit	Sum of the Ampere Rating of all Devices installed in the Panel	Wattage = Sum of the Ampere Ratings of all of the Devices Times The Branch Circuit Voltage (B x C)

Registration Number:

Registration Date/Time:

HERS Provider:

LINE-VOLTAGE TRACK LIGHTING WORKSHEET

CEC-NRCC-LTI-05-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-LTI-05-E
Indoor Lighting – Line-Voltage Track Lighting Worksheet		(Page 2 of 2)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

CERTIFICATE OF COMPLIANCE		NRCC-LTO-01-E
Outdoor Lighting		(Page 1 of 3)
Project Name:	Date Prepared:	

Project Address:	Total Illuminated Hardscape Area
General Information Phase of Construction: <input type="checkbox"/> New Construction <input type="checkbox"/> Addition <input type="checkbox"/> Alteration	
Outdoor Lighting Zone (OLZ) <input type="checkbox"/> OLZ-1 <input type="checkbox"/> OLZ-2 <input type="checkbox"/> OLZ-3 <input type="checkbox"/> OLZ-4	
The OLZ is: <input type="checkbox"/> Default in accordance with §10-114, or <input type="checkbox"/> Amended by the AHJ	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California: 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

LIGHTING COMPLIANCE DOCUMENTS (check box for each document included)	
<i>For detailed instructions on the use of this and all Energy Efficiency Standards compliance documents, refer to the Nonresidential Manual published by the California Energy Commission.</i>	
<input type="checkbox"/> NRCC-LTO-01-E	Certificate of Compliance
<input type="checkbox"/> NRCC-LTO-02-E	Outdoor Lighting Controls Certificate of Compliance
<input type="checkbox"/> NRCC-LTO-03-E	Outdoor Lighting Power Allowance Certificate of Compliance

CERTIFICATE OF COMPLIANCE		NRCC-LTO-01-E
Outdoor Lighting		(Page 2 of 3)
Project Name:	Date Prepared:	

Summary of Allowed Outdoor Lighting Power		Watts	
1.	Lighting Power Allowed for General Hardscape - NRCC-LTO-02-E	+	
2.	Lighting Power Allowed for Specific Application per Unit Length - NRCC-LTO-02-E	+	
3.	Lighting Power Allowed for Specific Application for Ornamental - NRCC-LTO-02-E	+	
4.	Lighting Power Allowed for Specific Application per Square Foot - NRCC-LTO-02-E	+	
5.	Sum Total of ALLOWED Outdoor Lighting Power	=	
Complies ONLY if Installed ≤ Allowed			↕
6.	INSTALLED Outdoor lighting from NRCC-LTI-01-E, page 4		

Declaration of Required Installation Certificates – Declare by checking all Installation Certificates that will be submitted. (Retain copies and verify forms are completed and signed.)	
<input type="checkbox"/> NRCI-LTO-01-E - Must be submitted for all buildings <input type="checkbox"/> NRCI-LTO-02-E - Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS), to be recognized for compliance.	<input type="checkbox"/> Field Inspector <input type="checkbox"/> Field Inspector
Declaration of Required Certificates of Acceptance – Declare by checking all of the Certificates of Acceptance that will be submitted. (Retain copies and verify forms are completed and signed.)	
<input type="checkbox"/> NRCA-LTO-02-E - Must be submitted for outdoor lighting controls.	<input type="checkbox"/> Field Inspector

Schedule of luminaires exempt from the outdoor lighting power requirements in §140.7	
Name or Symbol	Description of exempt luminaire in accordance with the exemptions
Schedule of luminaires exempt from the cutoff requirements in §130.2(b)	
Name or Symbol	Description of exempt luminaire in accordance with the exemptions
Schedule of luminaires exempt from the outdoor lighting control requirements in §130.2(c)	
Name or Symbol	Description of exempt luminaire in accordance with the exemptions

CERTIFICATE OF COMPLIANCE	NRCC-LTO-01-E
Outdoor Lighting	(Page 3 of 3)
Project Name:	Date Prepared:

A. OUTDOOR LIGHTING SCHEDULE and FIELD INSPECTION ENERGY CHECKLIST										
Luminaire Schedule		Installed Watts				Location	Cutoff	Field Inspector		
A	B	C	D		E	F	G	H	I	
Name or Item Tag	Complete Luminaire Description	Watts per Luminaire	How wattage was determined		Number of Luminares	Total Installed Watts in this area (C x E)	Primary Function area in which these luminaires are installed	BUG Rating	Pass	Fail
			CEC Default from NA8	According to §130.0(c)						
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>
INSTALLED WATTS PAGE TOTAL:							Enter sum total of all pages into NRCC-LTO-01-E; Page 2			

OUTDOOR LIGHTING CONTROLS

CEC-NRCC-LTO-02-E (Revised 06/13)



CERTIFICATE OF COMPLIANCE		NRCC-LTO-02-E
Outdoor Lighting Controls		(Page 1 of 3)
Project Name:	Date Prepared:	

The NRCC-LTO-02-E shall be used to document all mandatory outdoor lighting controls that are applicable to the project.

Mandatory Outdoor Lighting Control Declaration Statements

Check all that apply:

- ☐ Lighting shall be controlled by self-contained lighting control devices which are certified to the Energy Commission according to the Title 20 Appliance Efficiency Regulations in accordance with §110.9.
- ☐ Lighting shall be controlled by a lighting control a system or energy management control system in accordance with §110.9. An Installation Certificate shall be submitted in accordance with §130.4(b).
- ☐ All lighting controls and equipment shall comply with the applicable requirements in §110.9 and shall be installed in accordance with the manufacturer's instructions in accordance with §130.1
- ☐ Part-Night Outdoor Lighting Controls, as defined in Section 100.1, shall meet the requirements in Section 110.9(b)5
- ☐ All outdoor incandescent luminaires rated over 100 watts, determined in accordance with Section 130.0(c), shall be controlled by a motion sensor.
- ☐ All outdoor luminaires rated for use with lamps greater than 150 lamp watts, determined in accordance with Section 130.0(c), shall comply with Backlight, Uplight, and Glare (collectively referred to as "BUG") in accordance with Section 130.2(b)
- ☐ All installed outdoor lighting shall be controlled by a photocontrol or outdoor astronomical time-switch control in accordance with Section 130.2(c)1
- ☐ All installed outdoor lighting shall be circuited and independently controlled from other electrical loads by an automatic scheduling control in accordance with Section 130.2(c)2
- ☐ All installed outdoor lighting, where the bottom of the luminaire is mounted 24 feet or less above the ground, shall be controlled with automatic lighting controls in accordance with Section 130.2(c)3
- ☐ For Outdoor Sales Frontage, Outdoor Sales Lots, and Outdoor Sales Canopies lighting, an automatic lighting control in accordance with Section 130.2(c)4
- ☐ For Building Facade, Ornamental Hardscape and Outdoor Dining lighting, an automatic lighting control in accordance with Section 130.2(c)5
- ☐ Before an occupancy permit is granted for a newly constructed building or area, or a new lighting system serving a building, area, or site is operated for normal use, indoor lighting controls serving the building, area, or site shall be certified as meeting the Acceptance Requirements for Code Compliance in accordance with §130.4.(a). Outdoor lighting controls shall comply with the applicable requirements of Section 130.2(c) and Reference Nonresidential Appendix NA7.8



NRCC-LTO-02-E

(Page 2 of 3)

Date Prepared:

MANDATORY OUTDOOR LIGHTING CONTROL SCHEDULE and FIELD INSPECTION CHECKLIST

[illegible]

OUTDOOR LIGHTING CONTROLS

CEC-NRCC-LTO-02-E (Revised 06/13)



CERTIFICATE OF COMPLIANCE		NRCC-LTO-02-E
Outdoor Lighting Controls		(Page 3 of 3)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:



NRCC-LTO-03-E

(Page 1 of 6)

Date Prepared:

1. General Hardscape Lighting Power Allowance (Site Total from Section B of NRCC-LTO-03-E)	1.
--	----

PER APPLICATION from Section C-1		SALES FRONTAGE from Section C-2		ORNAMENTAL LIGHTING from Section C-3		PER SPECIFIC AREA from Section C-4.		
	+		+		+		=	2.

3. Total Allowed Outdoor Lighting Wattage (add rows 1 and 2)	3.
--	----

[illegible]

OUTDOOR LIGHTING POWER ALLOWANCES

CEC-NRCC-LTO-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-LTO-03-E
Outdoor Lighting Power Allowances		(Page 2 of 6)
Project Name:		Date Prepared:

C. ADDITIONAL SPECIFIC “USE IT OR LOSE IT” OUTDOOR LIGHTING POWER ALLOWANCES

- ☐ The additional specific outdoor lighting power allowance shall be the smaller of the allowed lighting power or the actual lighting power used.
- ☐ Use Outdoor Lighting Zone (OLZ) that is documented on page 1 of NRCC-LTO-01-E to calculate the specific wattage allowances.

C-1. SPECIFIC WATTAGE ALLOWANCE PER APPLICATION – Table 140.7-B

- ☐ Available only for Building Entrances or Exits; Primary Entrances to Senior Care Facilities, Police Stations, Hospitals, Fire Stations, and Emergency Vehicle Facilities; Drive Up Windows; Vehicle Service Station Uncovered Fuel Dispenser

A	B	C	D	E	F	G	H	I	J
Specific Lighting Application	ALLOTTED WATTS			DESIGN WATTS					Allowed Watts (smaller of D or I)
	Number of Luminaires	Wattage Allowance	Allotted Watts (B x C)	Luminaire Code or Symbol	Luminaire Description	Luminaire Quantity	Watts per luminaire	Design Watts (G x H)	
Sum total allowance per application on this site:									

C-2. WATTAGE ALLOWANCE PER UNIT LENGTH (Sales Frontage) from Table 140.7-B

A	B	C	D	E	F	G	H	I	J
Specific Lighting Application	ALLOTTED WATTS			DESIGN WATTS					Allowed Watts (smaller of D or I)
	Linear feet of Sales Frontage	Wattage Allowance per linear foot	Allotted Watts (B x C)	Luminaire Code or Symbol	Luminaire Description	Luminaire Quantity	Watts per luminaire	Design Watts (G x H)	
Sales Frontage									
Sales Frontage									
Sales Frontage									
Sales Frontage									
Sum total allowance for sales frontage on the site:									



NRCC-LTO-03-E

(Page 3 of 6)

Date Prepared:

☐ Allowance for the total site illuminated hardscape area. Luminaires qualifying for this allowance shall be rated for 100 watts or less as determined in accordance with Section 130.0(c), and shall be post-top luminaires, lanterns, pendant luminaires, or chandeliers.

A	B	C	D	E	F	G	H	I	J
Specific Lighting Application	ALLOTTED WATTS			DESIGN WATTS					
	Square feet of Hardscape	Wattage Allowance	Allotted Watts (B x C)	Luminaire Code or Symbol	Luminaire Description	Luminaire Quantity	Watts per luminaire	Design Watts (G x H)	Allowed Watts (smaller of D or I)
	Ornamental Lighting								
	Ornamental Lighting								
	Ornamental Lighting								
Sum total allowance for ornamental lighting on the site:.									

☐ Allowances for Building Facades; Outdoor Sales Lots; Vehicle Service Station Hardscape; Vehicle Service Station Canopies; Sales Canopies; Non-sales Canopies; Guard Stations; Student Pick-up/Drop-off zone; Outdoor Dining; Special Security Lighting for Retail Parking and Pedestrian Hardscape

[illegible]

OUTDOOR LIGHTING POWER ALLOWANCES

CEC-NRCC-LTO-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-LTO-03-E
Outdoor Lighting Power Allowances		(Page 4 of 6)
Project Name:		Date Prepared:

Sum total allowance per square foot of specific area on the site:	
---	--

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:



CERTIFICATE OF COMPLIANCE – DATA FIELD DEFINITIONS AND CALCULATIONS		NRCC-LTS-01-E
Sign Lighting		(Page 1 of 4)
Project Name:	Date Prepared:	
Project Address:		
Location of Sign	<input type="checkbox"/> Outdoor Signs <input type="checkbox"/> Indoor Signs	
Phase of Sign Construction	<input type="checkbox"/> New Signs <input type="checkbox"/> Sign Alterations	
Type of Lighting Control	<input type="checkbox"/> New Lighting Controls <input type="checkbox"/> Replaced Lighting Controls <input type="checkbox"/> Not Installing Lighting Controls	
This Certificate of Compliance includes the following components (check all that apply)		
<input type="checkbox"/> Mandatory Measures (Lighting Controls) <input type="checkbox"/> Maximum Allowed Lighting Power <input type="checkbox"/> Specific Lighting Sources		

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:



CERTIFICATE OF COMPLIANCE – DATA FIELD DEFINITIONS AND CALCULATIONS

NRCC-LTS-01-E

Sign Lighting

(Page 2 of 4)

Project Name:

Date Prepared:

3. Mandatory Sign Lighting Controls**NOTES:**

1. The same responsible person may install both the sign lighting power and the sign lighting controls, or a different responsible person may install the sign lighting controls than the responsible person installing the sign lighting power.
2. The Mandatory Measures (sign lighting controls) are required for compliance with the sign lighting Standards. If the person responsible for installing the sign lighting power is not also responsible for the sign lighting controls, then the owner of the sign, general contractor, or architect shall be responsible to have the sign lighting controls installed.
3. If more than one person has responsibility for compliance, each responsible person shall prepare and sign a Certificate of Compliance and an Installation Certificate applicable to the portion of construction for which they are responsible; alternatively, the person with chief responsibility for construction shall prepare and sign the Certificate of Compliance Declaration Statement for the entire construction.

3a. Statements of Responsibility: Any person signing the Certificate of Compliance Declaration Statement on page 1 of 4 on this SLTG-1C shall complete Part 3a. Check Yes or No for all of the following statements:

1	I have responsibility for installing the sign lighting controls <input type="checkbox"/> Yes, complete parts 3a and 3b of this form <input type="checkbox"/> No, complete part 3a of this form
2	There are no existing sign lighting controls and I will be installing compliant sign lighting controls <input type="checkbox"/> Yes <input type="checkbox"/> No
3	There are no existing sign lighting controls and someone else will be responsible to install compliant sign lighting controls <input type="checkbox"/> Yes <input type="checkbox"/> No
4	There are existing sign lighting controls that do not comply with the applicable provision of §110.9 and §130.3 and I will be installing compliant sign lighting controls <input type="checkbox"/> Yes <input type="checkbox"/> No
5	There are existing sign lighting controls that do not comply with the applicable provision of §110.9 and §130.3 and someone else will be responsible to install compliant sign lighting controls <input type="checkbox"/> Yes <input type="checkbox"/> No

3b. Mandatory Sign Lighting Controls

If the person signing the Certificate of Compliance Declaration Statement on page 1 of 4 of this SLTG-1C is responsible for complying with the sign lighting control requirements, that person shall answer all of the following questions:

If there are construction documents, indicate where on the building plans the mandatory measures (sign lighting control) note block can be located:

1	§130.3(a)1. All indoor sign lighting is controlled with an automatic time-switch control or astronomical time-switch control.	Y <input type="checkbox"/>	N <input type="checkbox"/>	NA <input type="checkbox"/>
2	§130.3(a)2A. All outdoor sign lighting is controlled with a photocontrol in addition to an automatic time-switch control, or an astronomical time-switch control.	Y <input type="checkbox"/>	N <input type="checkbox"/>	NA <input type="checkbox"/>
	EXCEPTION to Section 130.3(a)2A: Outdoor signs in tunnels, and signs in large permanently covered outdoor areas that are intended to be continuously lit, 24 hours per day and 365 days per year.	Y <input type="checkbox"/>		NA <input type="checkbox"/>
3	§130.3(a)2B. All outdoor sign lighting that is ON both day and night is controlled with a dimmer that provides the ability to automatically reduce sign lighting power by a minimum of 65 percent during nighttime hours. Signs that are illuminated at night and for more than 1 hour during daylight hours shall be considered ON both day and night.	Y <input type="checkbox"/>	N <input type="checkbox"/>	NA <input type="checkbox"/>
	EXCEPTION to Section 130.3(a)2B: Outdoor signs in tunnels and large covered areas that are intended to be illuminated both day and night.	Y <input type="checkbox"/>		NA <input type="checkbox"/>
4	§130.3(a)3. Demand Responsive Electronic Message Center Control. An Electronic Message Center (EMC) having a new connected lighting power load greater than 15 kW has a control installed that is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal.	Y <input type="checkbox"/>	N <input type="checkbox"/>	N/A <input type="checkbox"/>
	EXCEPTION to Section 130.3(a)3: Lighting for EMCs that is not permitted by a health or life safety statute, ordinance, or regulation to be reduced by 30 percent.	Y <input type="checkbox"/>		NA <input type="checkbox"/>

Field Inspector Notes:

NRCC-LTS-01-E

(Page 3 of 4)

Date Prepared:

Field Inspector Notes:



CERTIFICATE OF COMPLIANCE – DATA FIELD DEFINITIONS AND CALCULATIONS

NRCC-LTS-01-E

Sign Lighting

(Page 4 of 4)

Project Name:

Date Prepared:

5. Specific Lighting Source Method of Compliance**Certificate of Compliance and Field Inspection Energy Checklist**

Complete this part if there are signs using the Specific lighting source method of compliance. (Complete part 4 of this Certificate of Compliance if there are signs using the maximum allowed lighting power method of compliance)

A	B	C	D	E
Symbol or Code	Description	OPTIONAL ENERGY VERIFIED label (see instructions below)	Specific light source used for compliance Shall include only lighting technologies listed below List all that apply	Field Inspector Check that Sign Complies ✓
		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>		<input type="checkbox"/>

A Symbol or code used on the plans (when plans are required) and other documents.

B A narrative description of the sign, or location of sign on the building; and the location of sign on construction documents

C OPTIONAL - Check this box only if this sign has a permanent, pre-printed, factory-installed ENERGY VERIFIED label, confirming that this sign complies with the Section 140.8 of the California 2013 Title 24, Part 6 Standards, using the Specific Lighting Source Method of Compliance. The only labels that will be recognized for this purpose are ENERGY VERIFIED Certification Marks authorized by Underwriters Laboratories (UL) or other Product Certification Body accredited to ISO/IEC Guide 65 by the American National Standards Institute in accordance with ISO/IEC 17011. Surveillance by the Accredited Certification Body shall be an ongoing annual inspection program carried out by a Type A Inspection body in accordance with ISO/IEC 17020. For signs with such an ENERGY VERIFIED label, column 'D' is not required to be filled out. Note: Using an ENERGY VERIFIED label is an optional method to validate compliance. An ENERGY VERIFIED label is not needed for compliance.

D Specific Light Source Compliance Method. The sign(s) identified above use only the following lighting technologies:

List all applicable numbers (1 through 10) that apply in column D above for each row.

- | | |
|---|---|
| 1 | High pressure sodium lamps |
| 2 | Metal halide lamps that are pulse start or ceramic served by a ballast that has a minimum efficiency of 88 percent or greater. Ballast efficiency is the measured output wattage to the lamp divided by the measured operating input wattage when tested according to ANSI C82.6-2005. |
| 3 | Metal halide lamps that are pulse start that are 320 watts or smaller, are not 250 watt or 175 watt lamps, and are served by a ballast that has a minimum efficiency of 80 percent. Ballast efficiency is the measured output wattage to the lamp divided by the measured operating input wattage when tested according to ANSI C82.6-2005. |
| 4 | Neon or cold cathode lamps with transformer or power supply efficiency greater than or equal to a minimum efficiency of 75 percent when the transformer or power supply rated output current is less than 50 mA. The ratio of the output wattage to the input wattage is at 100 percent tubing load. |
| 5 | Neon or cold cathode lamps with transformer or power supply efficiency greater than or equal to a minimum efficiency of 68 percent when the transformer or power supply rated output current is 50 mA or greater. The ratio of the output wattage to the input wattage is at 100 percent tubing load. |
| 6 | Fluorescent lighting systems meeting one of the following requirements: A. Use only lamps with a minimum color rendering index (CRI) of 80; or B. Use only electronic ballasts with a fundamental output frequency not less than 20 kHz. |
| 7 | Light emitting diodes (LEDs) with a power supply having an efficiency of 80 percent or greater; |
| 8 | Single voltage external power supplies that are designed to convert 120 volt AC input into lower voltage DC or AC output, and have a nameplate output power less than or equal to 250 watts, shall comply with the applicable requirements of the Appliance Efficiency Regulations (Title 20). |
| 9 | Compact fluorescent lamps that do not contain a medium screw base sockets (E24/E26). |

E This page doubles as a field inspection checklist.

Field Inspector Notes:

**CERTIFICATE OF COMPLIANCE**

NRCC-MCH-01-E

Mechanical Systems

(Page 1 of 4)

Project Name:

Date Prepared:

MECHANICAL COMPLIANCE FORMS & WORKSHEETS (check box if worksheet is included)

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, refer to the 2013 Nonresidential Manual

Note: The Enforcement Agency may require all forms to be incorporated onto the building plans.

YES	NO	Form/Worksheet #	Title
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-01E (Part 1 of 3)	Certificate of Compliance, Declaration. Required on plans for all submittals.
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-01E (Part 2 of 3)	Certificate of Compliance, Required Acceptance Tests (MCH-02A to 11A). Required on plans for all submittals.
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-01E (Part 3 of 3)	Certificate of Compliance, Required Acceptance Tests (MCH-12A to 18A). Required on plans where applicable.
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-02E (Part 1 of 2)	Mechanical Dry Equipment Summary is required for all submittals with Central Air Systems. It is optional on plans.
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-02E (Part 2 of 2)	Mechanical Wet Equipment Summary is required for all submittals with chilled water, hot water or condenser water systems. It is optional on plans.
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-03E	Mechanical Ventilation and Reheat is required for all submittals with multiple zone heating and cooling systems. It is optional on plans.

MECHANICAL HVAC ACCEPTANCE FORMS (check box for required forms)**Designer:**

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

Installing Contractor:

The contractor who installed the equipment is responsible to either conduct the acceptance test them self or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible.

Enforcement Agency:

Plancheck – The NRCC-MCH-01-E form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked.

Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description		MCH-02A	MCH-03A	MCH-04A	MCH-05A	MCH-06A	MCH-07A	MCH-08A	MCH-09A	MCH-10A	MCH-11A
Equipment Requiring Testing or Verification	# of units	Outdoor Ventilation	Single Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Control Ventilation (DCV)	Supply Fan VAV	Valve Leakage Test	Supply Water Temp. Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



CERTIFICATE OF COMPLIANCE

NRCC-MCH-01-E

Mechanical Systems

(Page 2 of 4)

Project Name:

Date Prepared:

MECHANICAL HVAC ACCEPTANCE FORMS (check box for required forms)**Designer:**

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

Installing Contractor:

The contractor who installed the equipment is responsible to either conduct the acceptance test them self or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible. The following tests require a

Enforcement Agency:

Plancheck – The NRCC-MCH-01-E form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked.

Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description		MCH-12A	MCH-13A	MCH-14A	MCH-15A	MCH-16A	MCH-17A	MCH-18A
Equipment Requiring Testing or Verification	# of units	Fault Detection & Diagnostics for DX Units	Automatic Fault Detection & Diagnostics for Air & Zone	Distributed Energy Storage DX AC Systems	Thermal Energy Storage (TES) Systems	Supply Air Temperature Reset Controls	Condenser Water Reset Controls	ECMS
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



CERTIFICATE OF COMPLIANCE		NRCC-MCH-01-E
Mechanical Systems		(Page 3 of 4)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

HVAC SYSTEM REQUIREMENTS

CEC-NRCC-MCH-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-MCH-02-E
HVAC Dry System Requirements		(Page 1 of 3)
Project Name:	Date Prepared:	

Equipment Tags and System Description ¹	T-24 Sections	Reference to the Requirements in the Contract Documents ²		
MANDATORY MEASURES				
Heating Equipment Efficiency ³	110.1 or 110.2(a)			
Cooling Equipment Efficiency ³	110.1 or 110.2(a)			
HVAC or Heat Pump Thermostats	110.2(b), 110.2(c)			
Furnace Standby Loss Control	110.2(d)			
Low leakage AHUs	110.2(f)			
Ventilation ⁴	120.1(b)			
Demand Control Ventilation ⁵	120.1(c)4			
Occupant Sensor Ventilation Control ⁶	120.1(c)5, 120.2(e)3			
Shutoff and Reset Controls ⁷	120.2(e)			
Outdoor Air and Exhaust Damper Control	120.2(f)			
Isolation Zones	120.2(g)			
Automatic Demand Shed Controls	120.2(h)			
Economizer FDD	120.2(i)			
Duct Insulation	120.4			
PRESCRIPTIVE MEASURES				
Equipment is sized in conformance with 140.4 (a & b)	140.4(a & b)	Y/N	Y/N	Y/N
Supply Fan Pressure Control	140.4(c)			
Simultaneous Heat/Cool ⁸	140.4(d)			
Economizer	140.4(e)			
Heat and Cool Air Supply Reset	140.4(f)			
Electric Resistance Heating ⁹	140.4(g)			
Duct Leakage Sealing and Testing. ¹⁰	140.4(l)			
Notes: <ol style="list-style-type: none"> Provide equipment tags (e.g. AHU 1 to 10) and system description (e.g. Single Duct VAV reheat) as appropriate. Multiple units with common requirements can be grouped together. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system. The referenced plans and specifications must include all of the following information: equipment tag, equipment nominal capacity, Title 24 minimum efficiency requirements, and actual rated equipment efficiencies. Where multiple efficiency requirements are applicable (e.g. full- and part-load) include all. Where appliance standards apply (110.1), identify where equipment is required to be listed per Title 20 1601 et seq. Identify where the ventilation requirements are documented for each central HVAC system. Include references to both central unit schedules and sequences of operation. If one or more space is naturally ventilated identify where this is documented in the plans and specifications. Multiple zone central air systems must also provide a MCH-03-E form. If one or more space has demand controlled ventilation identify where it is specified including the sensor specifications and the sequence of operation. If one or more space has occupant sensor ventilation control identify where it is specified including the sensor specifications and the sequence of operation. If the system is DDC identify the sequences for the system start/stop, optimal start, setback (if required) and setup (if required). For all systems identify the specification for the thermostats and time clocks (if applicable). Identify where the heating, cooling and deadband airflows are scheduled for this system. Include a reference to the specification of the zone controls. Provide a MCH-03-E form. Enter N/A if there is no electric heating. If the system has electric heating indicate which exception to 140.4(g) applies. If duct leakage sealing and testing is required, a MCH-04-A form must be submitted. 				

HVAC WET SYSTEM REQUIREMENTS

CEC-NRCC-MCH-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-MCH-02-E
HVAC Wet System Requirements		(Page 2 of 3)
Project Name:	Date Prepared:	

Equipment Tags and System Description ¹				
MANDATORY MEASURES	T-24 Sections	Reference to the Requirements in the Contract Documents²		
Heating Hot Water Equipment Efficiency ³	110.1			
Cooling Chilled and Condenser Water Equipment Efficiency ³	110.1, 140.4(i)			
Open and Closed Circuit Cooling Towers conductivity or flow-based controls	110.2(e) 1			
Open and Closed Circuit Cooling Towers Maximum Achievable Cycles of Concentration (LSI) ⁶	110.2(e) 2			
Open and Closed Circuit Cooling Towers Flow Meter with analog output	110.2(e) 3			
Open and Closed Circuit Cooling Towers Overflow Alarm	110.2(e) 4			
Open and Closed Circuit Cooling Towers Efficient Drift Eliminators	110.2(e) 5			
Pipe Insulation	120.3			
PRESCRIPTIVE MEASURES				
Cooling Tower Fan Controls	140.4(h)2, 140.4(h)5	Y/N	Y/N	Y/N
Cooling Tower Flow Controls	140.4(h)3			
Centrifugal Fan Cooling Towers ⁴	140.4(h)4			
Air-Cooled Chiller Limitation ⁵	140.4(j)			
Variable Flow System Design	140.4(k)			
Chiller and Boiler Isolation	140.4(k)			
CHW and HHW Reset Controls	140.4(k)			
WLHP Isolation Valves	140.4(k)			
VSD on CHW, CW & WLHP Pumps >5HP	140.4(k)			
DP Sensor Location	140.4(k)			
Notes: <ol style="list-style-type: none"> 1. Provide equipment tags (e.g. CH 1 to 3) or system description (e.g. CHW loop) as appropriate. Multiple units with common requirements can be grouped together. 2. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system. 3. The referenced plans and specifications must include all of the following information: equipment tag, equipment nominal capacity, Title 24 minimum efficiency requirements, and actual rated equipment efficiencies. Where multiple efficiency requirements are applicable (e.g. full- and part-load) include all. For chillers operating at non-standard efficiencies provide the Kadj values. For chillers also note whether the efficiencies are Path A or Path B. 4. Identify if cooling towers have propeller fans. If towers use centrifugal fans document which exception is used. 5. If air-cooled chillers are used, document which exceptions have been used to comply with 140.4(j) and the total installed design capacity of the air-cooled chillers in the chilled water plant. 6. Identify the existence of a completed MCH-06-E \when open or closed circuit cooling towers are specified to be installed, otherwise enter "N/A". 				

HVAC SYSTEM REQUIREMENTS

CEC-NRCC-MCH-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-MCH-02-E
HVAC Wet System Requirements	(Page 3 of 3)
Project Name:	Date Prepared:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

NRCC-MCH-03-E

(Page 1 of 2)

Date Prepared:

Yellow shaded cells require user input. Remaining cells are protected and automatic

- B. The largest amount of primary air supplied by the terminal unit when it's operating in the cooling mode.
- C. The smallest amount of primary air supplied by the terminal unit in the deadband mode.
- D. The largest amount of primary air supplied by the terminal unit when it's operating in the heating mode.
- E. A terminal unit can be controlled with DDC controls, or non-DDC controls. Each control category has different reheat limitations in code.
- F. Transfer Air must be provided where Required Ventilation Airflow (Column M) is greater than the Design Primary Deadband Airflow (Column C).



CERTIFICATE OF COMPLIANCE		NRCC-MCH-03-E
Mechanical Ventilation & Reheat		(Page 2 of 2)
Project Name:	Date Prepared:	

- H. Minimum ventilation rate per Section §120.1. Table 120.1-A.
- J. Based on number of fixed seats where applicable or the greater of the expected number of occupants and 50% of the CBC occupant load for egress purposes for spaces without fixed seating.
- M. Required Ventilation Airflow (Req'd Ventilation Airflow) is the larger of the ventilation rates calculated on an AREA BASIS or OCCUPANCY BASIS (Column I or L)
- N. This column identifies whether or not the Design Primary Deadband Airflow complies or not. It compares the value in column M to the value in column C and column F.
- O. Design Primary Cooling Airflow * 0.50 for DDC, Design Primary Cooling Airflow * 0.30 for Non-DDC. If the Design Primary Cooling Airflow is less than 300 cfm, then this is not applicable.
- P. Maximum of Column M and Column O. If the Design Primary Cooling Airflow is 300 cfm or less, then this is not applicable.
- Q. This column identifies whether or not the Design Primary Reheat Airflow at the zone level, complies or not. It compares the value in column P to the value in column D.
- R. Design Primary Cooling Airflow * 0.20 for DDC. Not applicable for Non-DDC zones or zones where Design Primary Cooling Airflow is 300 cfm or less.
- S. Maximum of Column M and Column R. Not applicable if the Design Primary Cooling Airflow is 300 cfm or less.
- T. This column identifies whether or not the Design Primary Deadband Airflow at the zone level, complies or not. It compares the value in column S to the value in column C.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

REQUIRED ACCEPTANCE TESTS

CEC-NRCC-MCH-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-MCH-04-E
Required Acceptance Tests	(Page 2 of 3)
Project Name:	Date Prepared:

MECHANICAL COMPLIANCE FORMS & WORKSHEETS (indicate if worksheet is included)

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, refer to the 2013 Nonresidential Manual Note: The Enforcement Agency may require all forms to be incorporated onto the building plans. Forms NRCC-MCH-04-E and NRCC-MECH-05-E are alternative forms to NRCC-MCH-01-E, NRCC-MCH-02-E and NRCC-MCH-03-E for projects using only single zone packaged HVAC systems.

YES	NO	Form	Title
		NRCC-MCH-04-E (1 of 2)	Certificate of Compliance. Required on plans when used.
		NRCC-MCH-04-E (2 of 2)	Mechanical Acceptance Tests. Required on plans when used.
		NRCC-MCH-05-E (1 of 2)	HVAC Prescriptive Requirements. It is required on plans when used.
		NRCC-MCH-05-E (2 of 2)	Mechanical SWH Equipment Summary is required for all submittals with service water heating, pools or spas. It is required on plans where applicable.

REQUIRED ACCEPTANCE TESTS

CEC-NRCC-MCH-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-MCH-04-E
Required Acceptance Tests		(Page 2 of 3)
Project Name:	Date Prepared:	

Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the applicable boxes by all acceptance tests that apply and list all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems. The NA number designates the Section in the Appendix of the Nonresidential Reference Appendices Manual that describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Enforcement Agency:

Systems Acceptance. Before occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.

Systems Acceptance. Before occupancy permit is granted. All newly installed HVAC equipment must be tested using the Acceptance Requirements. .

The NRCC-MCH-04-E form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked. The equipment requiring testing, person performing the test (Example: HVAC installer, TAB contractor, controls contractor, PE in charge of project) and what Acceptance test must be conducted. The following checked-off forms are required for ALL newly installed and replaced equipment. In addition a Certificate of Acceptance forms shall be submitted to the building department that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of Section 10-103(b) and Title 24 Part 6. The building inspector must receive the properly filled out and signed forms before the building can receive final occupancy.

Test Description		MCH-02A	MCH-03A	MCH-04A	MCH-05A	MCH-06A	MCH-07A	MCH-11A	MCH-12A	MCH-14A	MCH-18A	Test Performed By:
Equipment Requiring Testing or Verification	# of units	Outdoor Ventilation	Single Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Control Ventilation (DCV)	Supply Fan VAV	Valve Leakage Test	Supply Water Temp. Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control	

REQUIRED ACCEPTANCE TESTS

CEC-NRCC-MCH-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-MCH-04-E
Required Acceptance Tests		(Page 2 of 3)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

REQUIREMENTS FOR PACKAGED SINGLE ZONE UNITS

CEC-NRCC-MCH-05-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-MCH-05-E
Requirements for Packaged Single-Zone Units	(Page 1 of 2)
Project Name:	Date Prepared:

Equipment Tag(s) ¹	T-24 Sections	Requirement ³	As Scheduled ³	Requirement ³	As Scheduled ³	Requirement ³	As Scheduled ³
MANDATORY MEASURES							
Heating Equipment Efficiency ⁴	110.1 or 110.2(a)						
Cooling Equipment Efficiency ⁴	110.1 or 110.2(a)						
Thermostats ⁵	110.2(b), 110.2(c)						
Furnace Standby Loss Control ⁶	110.2(d)						
Ventilation ⁷	120.1(b)						
Demand Control Ventilation ⁸	120.1(c)4						
Occupant Sensor Ventilation Control ⁸	120.1(c)5, 120.2(e)3						
Shutoff and Reset Controls ⁹	120.2(e)						
Outdoor Air and Exhaust Damper Control	120.2(f)						
Automatic Demand Shed Controls	120.2(h)						
Economizer FDD	120.2(i)						
Duct Insulation	120.4						
PRESCRIPTIVE MEASURES							
Equipment is sized in conformance with 140.4 (a & b)	140.4(a & b)						
Economizer	140.4(e)						
Electric Resistance Heating ¹⁰	140.4(g)						
Duct Leakage Sealing and Testing. ¹¹	140.4(l)						
Notes:							
1. Provide equipment tags (e.g. AC1 or AC1 to 10). Multiple units of the same make and model with the same application and accessories can be grouped together.							
2. Enter the following information as appropriate: Unit Manufacturer; Unit Model Number (including all accessories); Description of the unit (e.g. gas-pack or heat pump; rated heating capacity (enter "N/A" if no heating); and, rated cooling capacity (enter "N/A" if no cooling). For unit capacities include the units (e.g. kBtuh or tons).							
3. For each requirement, enter the minimum requirement from the Standard in the left column (under "Standard Requirement"). In the right column (under "As Scheduled") enter the value for the units as specified.							
4. Where there is more than one requirement (e.g. full and part load efficiency) enter both with the appropriate labels (e.g. COP and IEER).							
5. In the left column identify the thermostatic requirements from the standard (e.g. programmable setback thermostat or heatpump with electric heat), . In the right column indicate the capabilities of the thermostat as scheduled.							
6. If the unit has a furnace which is rated at >=225,000 Btuh of capacity, indicate the rated standby loss and ignition source (e.g. IID). If there is no furnace or the unit is rated for <225,000 Btuh indicate "N/A".							
7. In the left column, enter both the required ventilation value from Table 120.1A and for the number of occupants times 15 cfm/person. In the right column enter the actual minimum ventilation as scheduled. If the space is naturally ventilated enter "N/A" in the left column and "the space is naturally ventilated" in the right column.							
8. If the space is required to have either DCV or Occupant Sensor Ventilation Control indicate "required" in the left column (otherwise indicate "N/A" in the left column). If either DCV or Occupant Sensor Ventilation Control is provided indicate "provided" in the right column (otherwise indicate "N/A" in the right column)							
9. In the left column indicate the required time controls from the standard. In the right column identify the device that provides this functionality (e.g. EMCS or programmable timeclock).							
10. Enter N/A if there is no electric heating. If the system has electric heating indicate which exception to 140.4(g) applies.							
11. If duct leakage sealing and testing is required, a MCH-04-A form must be submitted.							

REQUIREMENTS FOR PACKAGED SINGLE ZONE UNITS

CEC-NRCC-MCH-05-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-MCH-05-E
Requirements for Packaged Single-Zone Units		(Page 2 of 2)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:



CERTIFICATE OF COMPLIANCE		NRCC-MCH-06-E
Maximum Cycles of Concentration Worksheet		(Page 1 of 1)
Project Name:	Date Prepared:	

A. Langelier Saturation Index (LSI) Calculation		
01	Maximum Skin Temperature (F)	
02	Conductivity	
03	M-Alkalinity	
04	Calcium Hardness	
05	Magnesium Hardness	
06	Enter Target Tower Cycles	
07	Make-up pH @Target Cycles	
08	Calculated pH @Target Cycles	
09	Tower LSI Based on Calculated pH	
10		Pass or Fail

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

LSI Worksheet Instructions

Section A. LSI calculation

1. Enter the Maximum Skin Temperature in degrees F or use the default of 110 °F.
2. Enter the Conductivity from the annual report provided by the local water utility.
3. Enter the M-Alkalinity from the annual report provided by the local water utility.
4. Enter the Calcium Hardness from the annual report provided by the local water utility.
5. Enter the Magnesium Hardness from the annual report provided by the local water utility.
6. Enter the Target Tower Cycles
7. Make-Up pH is based on the following:
 - If line 1=0, then Make-Up pH=0
 - Else if line 1 > 0, then Make-Up pH= $\{\log[(\text{line}6*\text{line}3)*0.9*1.219]+2.19\}/0.55$
8. Calculated pH is based on the following:
 - If line 1=0, then Calculated pH=0
 - Else if line 1 > 0, then Calculated pH= $\{[\log(\text{line}6*\text{line}2*0.8)*.1111]+12.3-\{\log(\text{line}6^2*\text{line}4*\text{line}3)+\{0.00915*\text{line}1\}\}$
9. LSI = line 7 – line 8.
10. This field displays “pass” or “fail” based on the value in line 9. Display “Pass” if line 9 ≤ 2.5, otherwise the field should display “Failed”.

WATER HEATING SYSTEM GENERAL INFORMATION

CEC-NRCC-PLB-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-PLB-01-E
Water Heating System General Information		(Page 1 of 3)
Project Name:	Date Prepared:	

A. GENERAL INFORMATION/SYSTEM INFORMATION		
1.	Water Heater System Name:	
2.	Water Heater System Configuration:	
3.	Water Heater System Type:	
4.	Building Type:	
5.	Total Number of Water Heaters in Systems:	
6.	Central DHW Distribution Type:	
7.	Dwelling Unit DHW Distribution Type:	
<p>The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.</p>		

B. WATER HEATER INFORMATION		
<i>Each water heater type requires a separate form.</i>		
1.	Water Heater Type:	
2.	Fuel Type	
3.	Number of Identical Water Heaters:	
4.	Efficiency:	
5.	Required Minimum Efficiency:	
6.	Standby Total or Standby:	
7.	Rated Input	
8.	Pilot Energy:	
9.	Water Heater Tank Storage Volume:	
10.	Exterior Insulation On Water Heater:	
11.	Volume of Supplemental Storage:	
12.	Internal Insulation on Supplemental Storage:	
13.	Exterior Insulation on Supplemental Storage:	
<p>The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.</p>		

WATER HEATING SYSTEM GENERAL INFORMATION

CEC-NRCC-PLB-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-PLB-01-E
Water Heating System General Information		(Page 2 of 3)
Project Name:	Date Prepared:	

PLUMBING COMPLIANCE FORMS & WORKSHEETS (check box if worksheet is included)

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, refer to the 2013 Nonresidential Manual

Note: The Enforcement Agency may require all forms to be incorporated onto the building plans.

YES	NO	Form/Worksheet #	Title
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-PLB-01-E	Certificate of Compliance, Declaration. Required on plans for all submittals.
<input type="checkbox"/>	<input type="checkbox"/>	NRCI-PLB-01-E	Certificate of Installation. Required on plans for all submittals.
<input type="checkbox"/>	<input type="checkbox"/>	NRCI-PLB-02A-E	Certificate of Compliance, required on single dwelling unit systems in high-rise residential, hotel/motel application.
<input type="checkbox"/>	<input type="checkbox"/>	NRCI-PLB-02B-E	Certificate of Compliance, required on single dwelling unit systems in nonresidential application.
<input type="checkbox"/>	<input type="checkbox"/>	NRCI-PLB-03A-E	Certificate of Compliance, required on central systems in high-rise residential, hotel/motel application.
<input type="checkbox"/>	<input type="checkbox"/>	NRCI-PLB-03B-E	Certificate of Compliance, required on central systems in nonresidential application.
<input type="checkbox"/>	<input type="checkbox"/>	NRCI-PLB-21-H	Certificate of Compliance, required on HERS verified central systems in high-rise residential, hotel/motel application.
<input type="checkbox"/>	<input type="checkbox"/>	NRCI-STH-01-E	Certificate of Compliance, required on any solar water heating



CERTIFICATE OF COMPLIANCE		NRCC-PLB-01-E
Water Heating System General Information		(Page 3 of 3)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

A. GENERAL INFORMATION/SYSTEM INFORMATION		
1.	Water Heater System Name:	<<User input>>
2.	Water Heater System Configuration:	<< Nonresidential, Single Dwelling Unit or Central (User input)>>
3.	Water Heater System Type:	<< Domestic Hot Water, Combined Hydronic, or Heat recovery (User input)>>
4.	Building Type	<<Nonresidential, or High Rise Residential/Hotel/Motel (User input)>>
5.	Total Number of Water Heaters in Systems:	<<text (User input)>>
6.	Central DHW Distribution Type:	<<Multiple Dwelling Units – Recirculation Temperature Modulation Control; or Multiple Dwelling Units – Recirculation Continuous Monitoring Systems; or Multiple Dwelling Units – Demand Recirculation; or Other (User input)>>
7.	Dwelling Unit DHW Distribution Type:	<<Standard Distribution System (STD); or Pipe Insulation Credit (PIC); or Recirculation non demand controls (R-ND); or Demand Recirculation – Manual Control (R-DRmc); or Demand Recirculation – Sensor Control (RDRsc); or Other (User input)>>
<p>The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.</p>		

B. WATER HEATER INFORMATION		
<i>Each water heater type requires a separate form.</i>		
1.	Water Heater Type:	<<text (User input)>>
2.	Fuel Type	<< Gas, Propane, or Electricity (User input)>>
3.	Number of Identical Water Heaters:	<<User input>>
4.	Efficiency:	<<User input>>
5.	Required Minimum Efficiency:	<<User input>>
6.	Standby Total or Standby:	<<User input>>
7.	Rated Input	<<User input>>
8.	Pilot Energy:	<<User input>>
9.	Water Heater Tank Storage Volume:	<<User input>>
10.	Exterior Insulation On Water Heater:	<<User input>>
11.	Volume of Supplemental Storage:	<<User input >>
12.	Internal Insulation on Supplemental Storage:	<<User input >>
13.	Exterior Insulation on Supplemental Storage:	<<User input >>
<p>The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.</p>		

PROCESS COMPLIANCE FORMS AND WORKSHEETS

CEC-NRCC-PRC-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-PRC-01-E
Process Compliance Forms & Worksheets		(Page 1 of 3)
Project Name:	Date Prepared:	

PROCESS COMPLIANCE FORMS & WORKSHEETS (check box if worksheet is included)			
<i>For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, refer to the 2008 Nonresidential Manual Note: The Enforcement Agency may require all forms to be incorporated onto the building plans.</i>			
YES	NO	Form/Worksheet #	Title
<input type="checkbox"/>	<input type="checkbox"/>	PRC-01-E (1 of 2)	Covered Process Certificate of Compliance. Required on plans for all submittals with covered processes.
<input type="checkbox"/>	<input type="checkbox"/>	PRC-01-E (2 of 2)	Certificate of Compliance, Required Acceptance Tests (PRC-02-A to PRC-8-A). Required on plans for all submittals.
<input type="checkbox"/>	<input type="checkbox"/>	PRC-02-E	Compliance Form for Enclosed Parking Garage Exhaust Fans
<input type="checkbox"/>	<input type="checkbox"/>	PRC-03-E	Compliance Form for Commercial Kitchens
<input type="checkbox"/>	<input type="checkbox"/>	PRC-04-E	Compliance Form for Computer Rooms
<input type="checkbox"/>	<input type="checkbox"/>	PRC-05-E	Compliance Form for Commercial Refrigeration
<input type="checkbox"/>	<input type="checkbox"/>	PRC-06-E	Compliance Form for ALL Refrigerated Warehouses
<input type="checkbox"/>	<input type="checkbox"/>	PRC-07-E	Compliance Form for Refrigerated Warehouse $\geq 3,000$ ft ²
<input type="checkbox"/>	<input type="checkbox"/>	PRC-08-E	Compliance Form for Refrigerated Warehouse Where Multiple Spaces that (i) comprise a total of 3,000 square feet or more; and (ii) are collectively served by the same refrigeration system compressor(s) and condenser(s) (central systems).
<input type="checkbox"/>	<input type="checkbox"/>	PRC-09-E	Compliance Form for Laboratory Exhaust
<input type="checkbox"/>	<input type="checkbox"/>	PRC-10-E	Compliance Form for Compressed Air Systems
<input type="checkbox"/>	<input type="checkbox"/>	PRC-11-E	Compliance Form for Process Boilers

PROCESS COMPLIANCE FORMS AND WORKSHEETS

CEC-NRCC-PRC-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

**CERTIFICATE OF COMPLIANCE**

NRCC-PRC-01-E

Required Acceptance Tests

(Page 3 of 3)

Project Name:

Date Prepared:

PROCESS ACCEPTANCE FORMS (check box for required forms)**Designer:**

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for process systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. If all equipment of the same type requires a test, list the equipment description and the number of systems.

Installing Contractor:

The contractor who installed the equipment is responsible to either conduct the acceptance test them self or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible.

Enforcement Agency:

Plancheck – The NRCC-PRC-01-E form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked.

Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description		PRC-01A	PRC-02A	PRC-03A	PRC-04A	PRC-05A	PRC-06A	PRC-07A	PRC-08A
Equipment Requiring Testing or Verification	# of units	Compressed Air Systems	Kitchen Exhaust	Garage Exhaust	RHW Evap Fan Motor Controls	RHW Evap Condenser Controls	RHW Air-Cooled Condenser Controls	RHW Variable Speed Compressors	RHW Elect. Underslab Heating
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PROCESS COMPLIANCE FORMS AND WORKSHEETS

CEC-NRCC-PRC-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-PRC-01-E
Required Acceptance Tests		(Page 3 of 3)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:



CERTIFICATE OF COMPLIANCE		NRCC-PRC-02-E
Garage Exhaust		(Page 1 of 1)
Project Name:	Date Prepared:	

DESIGN EXHAUST AIRFLOW (CFM) ¹ :	EXCEPTIONS ² :	
Equipment Tags and System Description³		
MANDATORY MEASURES	T-24 Sections	Reference to the Requirements in the Contract Documents⁴
Exhaust Fan Control	120.6 (c)1 & 2	
CO Sensor Location	120.6 (c)3	
CO Sensor Setpoint	120.6 (c)4	
Minimum Ventilation	120.6 (c)5	
Garage Pressurization	120.6 (c)6	
CO Sensor Requirements	120.6 (c)6	
Ventilation System Acceptance Testing	120.6 (c)8	
Notes:		
1. Enter the airflow (cfm) of garage exhaust that is being installed under this project.		
2. Detail any exceptions that apply to this project. Reference appropriate exception number from §120.6 where applicable.		
3. Provide equipment tags (e.g. EF-1 & 2 for garage exhaust fans that are part of this project)		
4. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system.		

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Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

COMMERCIAL KITCHEN REQUIREMENTS

CEC-NRCC-PRC-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-PRC-03-E
Commercial Kitchen Requirements		(Page 1 of 2)
Project Name:	Date Prepared:	

KITCHEN ROOM NUMBER ¹				
TOTAL INSTALLED TYPE I and II KITCHEN HOOD EXHAUST (CFM) ² :	VENTILATION COMPLIANCE METHOD:			
TOTAL BYPASS HOOD MUA (CFM) ³ :	Small Kitchens ($\leq 5,000$ CFM Type I and II Hood Exhaust)			
TOTAL TRANSFER AIR AIRFLOW (CFM) ⁴ :	140.9(b)2 A i or 140.9(b)2 A ii			
TOTAL MECHANICALLY HEATED OR COOLED MAKE UP AIR (CFM) ⁵ :	Large Kitchens ($> 5,000$ CFM Type I and II Hood Exhaust)			
TOTAL AIR NEEDED FOR HEATING OR COOLING (CFM) ⁶ :	140.9(b)2Bi or 140.9(b)2Bii(a) or o 140.9(b)2Bii(b) or			
TOTAL EXHAUST AIR WITH DEMAND VENTILATION SYSTEMS ⁷ :	140.9(b)2Bii(c) or 140.9(b)2Bii(d)			
Equipment Tags and System Description⁸				
PRESCRIPTIVE MEASURES	<i>T-24 Sections</i>	<i>Reference to the Requirements in the Contract Documents⁹</i>		
Bypass Hood Exhaust and MUA	140.9(b)1A			
Type I/II Hood Exhaust	140.9(b)1B, Table 140.9-A			
Mechanically heated or cooled make up air	140.9(b)2A			
Demand Ventilation Systems	140.9(b)2Bii			
Energy Recovery Systems	140.9(b)2Biii			
Tempered/Non Mechanical Cooling Air Systems	140.9(b)2Biv			
Notes:				
1. Fill in one form for each kitchen in the project.				
2. Enter the total installed type I and II kitchen hood exhaust airflow in cubic feet per minute (cfm).				
3. Enter the make-up air to bypass hoods (cfm).				
4. Enter the total transfer air (cfm).				
5. Enter the total mechanically cooled or heated make up air (cfm).				
6. Enter the maximum air needed for heating or cooling loads (cfm).				
7 Enter the design airflow (cfm) of exhaust with demand ventilation system controls				
8. Provide equipment tags (e.g., AHU 1 & 2 or Hoods 1 to 5) for all equipment that is covered by these requirements. Equipment that is similar in requirements and compliance can be grouped in a single column.				
9. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system. Explicitly list any exceptions used to avoid a requirement.				

COMMERCIAL KITCHEN REQUIREMENTS

CEC-NRCC-PRC-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-PRC-03-E
Commercial Kitchen Requirements		(Page 2 of 2)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
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Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

COMPUTER ROOM REQUIREMENTS

CEC-NRCC-PRC-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-PRC-04-E
Computer Room Requirements		(Page 1 of 1)
Project Name:	Date Prepared:	

TOTAL INSTALLED COOLING CAPACITY (TONS)¹:				
Equipment Tags and System Description²				
PRESCRIPTIVE MEASURES	T-24 Sections	Reference to the Requirements in the Contract Documents³		
Economizers	140.9(a)1			
Reheat	140.9(a)2			
Humidification	140.9(a)3			
Fan Power	140.9(a)4			
Fan Control	140.9(a)5			
Containment	140.9(a)r			
Notes: 1. Enter the total installed cooling capacity for all computer rooms under this permit 2. Provide equipment tags (e.g. CRAC-1 to 10, AHU 1 to 5 and CH 1 to 3) for all cooling systems that are covered by these requirements. Groups of equipment that are similar can be combined into one column. 3. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system. Explicitly list any exceptions used to avoid a requirement.				

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Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:



CERTIFICATE OF COMPLIANCE		NRCC-PRC-05-E
Commercial Refrigeration		(Page 1 of 5)
Project Name:	Date Prepared:	

General Information

Building Area: ☐ Retail Food Store Conditioned Area $\geq 8,000 \text{ ft}^2$
☐ Retail Food Store Conditioned Area $< 8,000 \text{ ft}^2$

(Note: If the Retail Food Store Conditioned Area is $< 8,000 \text{ ft}^2$ then the Retail Food Store need not comply)

Phase of Construction: ☐ New Construction ☐ Addition ☐ Alteration

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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Company:	Signature Date:
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Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

CERTIFICATE OF COMPLIANCE	NRCC-PRC-05-E
Commercial Refrigeration	(Page 2 of 5)
Project Name:	Date Prepared:

MANDATORY REQUIREMENTS							
Are new condensers replacing existing condensers when: The attached compressor system total heat of rejection does not increase? Yes <input type="checkbox"/> No <input type="checkbox"/> Less than 25% of the attached compressors and the attached refrigerated display cases are new? Yes <input type="checkbox"/> No <input type="checkbox"/>							
<i>If Yes to both questions for all systems, the condenser(s) need not comply (exception §120.6(b)). Continue to page 3 or 4.</i>							
CONDENSER MANDATORY MEASURE	T-24 Sections	Indicate page reference for information on the plans or specification, or list information below					
Condenser ID or Tag (e.g. Cond-1)							
Continuously variable speed fans? Fan speed controlled in unison for all fans serving a common condenser high side?	§120.6(b)1A						
Saturated condensing temperature setpoint reset based on ambient dry bulb temperature for air-cooled condensers and ambient wet bulb temperature for evaporative condensers?	§120.6(b)1B,C						
Specify the minimum saturated condensing temperature setpoint. Complies if the minimum saturated condensing temperature setpoint ≤ 70°F.	§120.6(b)1D						
Minimum allowed condenser efficiency. Reference Table 120.6-C.	§120.6(b)1E						
Installed condenser specific efficiency from worksheet CR-2C							
Is the installed condenser efficiency ≥ the minimum allowed condenser efficiency?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 1 to §120.6(b)1E. Condenser with total heat rejection capacity of < 150,000 Btuh at the specific efficiency conditions.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 2 to §120.6(b)1E. Condenser operating in Climate Zone 1.		<input type="checkbox"/>					
Exception 3 to §120.6(b)1E. Existing condenser reused for an addition or alteration.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Air-cooled Condenser Installed? If Yes then Fill Out Next 3 Rows</i>	§120.6(b)1F						
Fin density (fins per inch). Complies if fin density ≤10.							
Exception 1 to §120.6(b)1F. Condenser is a micro-channel condenser.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 2 to §120.6(b)1F. Existing condenser is being reused.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CERTIFICATE OF COMPLIANCE		NRCC-PRC-05-E
Commercial Refrigeration		(Page 3 of 5)
Project Name:	Date Prepared:	

Existing compressor system reused? If Yes, the compressor system need not comply. Yes <input type="checkbox"/> No <input type="checkbox"/> <i>If Yes to both questions for all systems, the condensers need not comply (exception §120.6(b)). Continue to page 4 or 4.</i>							
COMPRESSOR SYSTEM MANDATORY MEASURES	T-24 Sections	Indicate page reference for information on the plans or specification, or list information below					
Compressor System / Suction Group ID or Tag (e.g. Rack A)							
Saturated suction temperature setpoint reset based on the temperature requirements of loads?	§120.6(b)2A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 1 to §120.6(b)2A. Single compressor system with no variable capacity capability.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 2 to §120.6(b)2A. Suction group with design saturated suction temperature (SST) ≥ 30°F.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 2 to §120.6(b)2A. Suction group comprises of the high stage of a two-stage or a cascade system.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 2 to §120.6(b)2A. Suction group serves the secondary cooling fluid (e.g. glycol) chiller.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Design Saturated Suction Temperature (SST) ≤ -10°F and Suction Group Design Cooling Capacity Greater than 100MBH? If Yes then Fill Out the Next 3 Rows</i>	§120.6(b)2B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subcooled liquid temperature at the exit of the subcooler. Complies if the temperature is ≤ 50°F.							
Specify the saturated suction temperature (SST) of the suction group doing the subcooling. Complies if SST ≥ 18°F.							
Exception 1 to §120.6(b)2B. Suction group is the low temperature suction group of a cascade system.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CERTIFICATE OF COMPLIANCE	NRCC-PRC-05-E
Commercial Refrigeration	(Page 4 of 5)
Project Name:	Date Prepared:

REFRIGERATED DISPLAY CASES MANDATORY MEASURES	T-24 Sections	<i>Indicate page reference for information on the plans or specification, or list information below</i>
Refrigerated Display Cases		
Lights in the refrigerated display cases and lights installed on walk-in glass doors automatically turned off during non-business hours, or reduced by 50% of lighting power within 30 minutes after the nearby area is vacated?	§120.6(b)3	Yes No <input type="checkbox"/> <input type="checkbox"/>
Exception 1 to §120.6(b)3. Retail Food Store is open for business for 140 hours or more per week.		<input type="checkbox"/>
HEAT RECOVERY MANDATORY MEASURES	T-24 Sections	<i>Indicate page reference for information on the plans or specification, or list information below</i>
Heat Recovery System ID or Tag (e.g. HR-1)		
Heat recovery of at least 25% of the sum of the total heat rejection of the refrigeration systems with > 150,000 Btuh individual total heat rejection at design conditions?	§120.6(b)4A	<input type="checkbox"/>
Identify the page in plans showing the heat recovery calculations or attach the calculations to this form.		<input type="checkbox"/>
Exception 1 to §120.6(b)4A. Retail Food Store located in Climate Zone 15.		<input type="checkbox"/>
Exception 2 to §120.6(b)4A. Reused refrigeration and HVAC systems.		<input type="checkbox"/>
Identify the page number in plans showing the charge increase calculations or attach the calculations to this form.	§120.6(b)4B	<input type="checkbox"/>
A Specify the increase in refrigerant charge associated with heat recovery equipment and piping in lbs		<input type="checkbox"/>
B Specify the total amount of heat recovery heating capacity in MBH [MBH = 1,000 Btuh]		<input type="checkbox"/>
C A / B. Complies if C < 0.35 lbs/MBH.		<input type="checkbox"/>

Project Name:

Date Prepared:

Fan-Powered Condenser Specific Efficiency Worksheet

☐ EVAPORATIVE CONDENSER

Tag/ID	Fans				Pumps				Condenser		
	A	B	C	D	E	F	G	H	I	J	K
	Motor Power (HP) ¹	Motor Efficiency	Motor Input Power (kW) 0.746 * A / B	Total Fan Power (kW)	Motor Power (HP)	Motor Efficiency	Motor Input Power (kW) 0.746 * E / F	Total Pump Power (kW)	Capacity (MBH) ²	Total Input Power (kW) D + H	Specific Efficiency (Btuh/Watt) I / J
	Fan 1 ____ Fan 2 ____ Fan 3 ____	Fan 1 ____ Fan 2 ____ Fan 3 ____	Fan 1 ____ Fan 2 ____ Fan 3 ____		Pump 1 ____ Pump 2 ____	Pump 1 ____ Pump 2 ____	Pump 1 ____ Pump 2 ____				
	Fan 1 ____ Fan 2 ____ Fan 3 ____	Fan 1 ____ Fan 2 ____ Fan 3 ____	Fan 1 ____ Fan 2 ____ Fan 3 ____		Pump 1 ____ Pump 2 ____	Pump 1 ____ Pump 2 ____	Pump 1 ____ Pump 2 ____				

1. Enter the nominal HP for each fan motor. If the manufacturer specifies the input power in kW, then skip to column C and enter it there.
2. Enter the rated capacity of the condenser at 100°F saturated condensing temperature and 70°F ambient wetbulb temperature.

☐ AIR-COOLED CONDENSER

Tag/ID	Fans				Condenser	
	A	B	C	D	E	F
	Number of Fans	Motor Power (HP) ¹	Motor Efficiency	Total Input Power (Watts) 746 * A * B / C	Capacity (Btuh) ²	Specific Efficiency (Btuh/Watt) E / D

1. Enter the nominal HP for each fan motor. If the manufacturer specifies the input power in kW, then skip to column D and enter it there.
2. Enter the rated capacity of the condenser at 105°F saturated condensing temperature and 95°F ambient drybulb temperature (10°F temperature difference).

REFRIGERATED WAREHOUSE

CEC-NRCC-PRC-06-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-PRC-06-E
Refrigerated Warehouse	
Project Name:	Date Prepared:

General Information			
Phase of Construction:	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
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Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

Refrigerated Warehouse Mandatory Measures	
Indicate location on building plans of Refrigerated Warehouse Mandatory Measures Note Block: _____	
Refrigerated Warehouse Compliance Forms and Worksheets (Check box for required worksheet)	
<input type="checkbox"/> NRCC-PRC-06-E	Certificate of Compliance (Required for all refrigerated warehouses).
<input type="checkbox"/> NRCC-PRC-07-E	Required when the refrigerated warehouse is 3,000 ft ² or greater.
<input type="checkbox"/> NRCC-PRC-08-E	Required when multiple spaces are 3,000 ft ² or more and served by the same refrigeration system.

REFRIGERATED WAREHOUSE

CEC-NRCC-PRC-06-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-PRC-06-E
Refrigerated Warehouse	(Page 2 of 3)
Project Name:	Date Prepared:

Condenser Efficiency Worksheet											
<input type="checkbox"/> WATER-COOLED CONDENSER SERVED BY A FLUID COOLER (EXEMPT)											
<input type="checkbox"/> EVAPORATIVE CONDENSER											
Tag/ ID	Fans				Pumps				Condenser		
	A	B	C	D	E	F	G	H	I	J	K
	Motor Power (HP) ¹	Motor Eff.	Motor Input Power (kW) (0.746 x A / B)	Total Fan Power (kW)	Motor Power (HP)	Motor Effi.	Motor Input Power (kW) (0.746 x E / F)	Total Pump Power (kW)	Capacity (MBH) ²	Total Input Power (kW) (D+H)	Specific Efficiency (Btuh/Watt) (I / J)
	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____		Pump: 1 ____ 2 ____ 3 ____ 4 ____	Pump: 1 ____ 2 ____ 3 ____ 4 ____	Pump: 1 ____ 2 ____ 3 ____ 4 ____				
	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____		Pump: 1 ____ 2 ____ 3 ____ 4 ____	Pump: 1 ____ 2 ____ 3 ____ 4 ____	Pump: 1 ____ 2 ____ 3 ____ 4 ____				
	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____	Fan: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____		Pump: 1 ____ 2 ____ 3 ____ 4 ____	Pump: 1 ____ 2 ____ 3 ____ 4 ____	Pump: 1 ____ 2 ____ 3 ____ 4 ____				

1. Enter the nominal HP for each fan motor. If the manufacturer specifies the input power in kW, then skip to column C and enter it there.

2. Enter the catalog capacity of the condenser at 100°F saturated condensing temperature and 70°F ambient wetbulb temperature.



NRCC-PRC-06-E

(Page 3 of 3)

Date Prepared:

☐ AIR-COOLED CONDENSER

1. Enter the nominal HP for each fan motor. If the manufacturer specifies the input power in kW, then skip to column D and enter it there.
2. Enter the catalog capacity of the condenser at 105°F saturated condensing temperature and 95°F ambient drybulb temperature (10°F temperature difference).

REFRIGERATED WAREHOUSE 3000 FT² OR GREATER

CEC-NRCC-PRC-07-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

**CERTIFICATE OF COMPLIANCE**

NRCC-PRC-07-E

Refrigerated Warehouse ≥ 3,000 ft²

(Page 1 of 3)

Project Name:

Date Prepared:

Building Type: ☐ Refrigerated Warehouse ≥ 3,000 ft² ☐ Refrigerated Warehouse < 3,000 ft²
(Note: If the Refrigerated Warehouse space is < 3,000 ft², then it must meet the requirements of the Appliance Efficiency Regulations for walk-in coolers or freezers contained in the Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601 through 1608).

ENVELOPE REQUIREMENTS**Insulation Details**

Tag/ID ¹	SPACE ²		Productive Underslab Heating ³	Assembly Type ⁴	Installed Insulation R-value ⁵	Minimum Required Insulation R-Value ⁶	Assembly Compliance ⁷	
	Cooler	Freezer					PASS	FAIL
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>

1. Indicate the identification name that matches the building plans.
2. Indicate the type of storage space.
3. Is the underslab heating provided by a heat exchanger that provides productive refrigeration capacity on the associated refrigeration system?
4. Is the assembly a wall, ceiling/roof, or floor?
5. List the R-value of the installed assembly.
6. This value can be obtained from §120.6, Table 120.6-A.
7. Does the installed insulation R-value comply with the mandatory insulation requirements of §120.6, Table 120.6-A required R-value?

REFRIGERATED WAREHOUSE 3000 FT² OR GREATER

CEC-NRCC-PRC-07-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-PRC-07-E
Refrigerated Warehouse \geq 3,000 ft ²	(Page 2 of 3)
Project Name:	Date Prepared:

MANDATORY MEASURES		T-24 Sections	Indicate page reference on the plans			
Underslab Heating (e.g. GHX-1)		§120.6(a)2				
Electric resistance heat is not used for purposes of underslab heating.						
Exception 1 to §120.6(a)2. The exempted electric resistance underslab heat is thermostatically controlled and disabled during the summer on-peak period defined by the local electric utility.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaporator ID or tags (e.g. Evap-1)						
New fan-powered evaporators: electronically commutated or minimum of 70% efficient motor (in accordance with NEMA Standard MG 1-2006) on all single phase fan motors <1 hp and <460 V.		§120.6(a)3A				
New fan-powered evaporators served by a suction group with multiple compressors, or by a single compressor with variable unloading: Variable speed fans, controlled in response to space temperature or humidity.		§120.6(a)3B				
Exception 1 to §120.6(a)3B. Exempted evaporator(s) that will replace less than all of the existing evaporators that do not have variable speed control.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 2 to §120.6(a)3B. Exempted evaporator(s) within a cooler that maintain a Controlled Atmosphere in which the fans must constantly operate at 100% of the design airflow.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception 3 to §120.6(a)3B. Exempted evaporator(s) in a refrigerated warehouse that are designed solely for the purpose of quick chilling or freezing of products. (space with design cooling capacities of greater than 240 Btu/hr-ft ²)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A	Total floor area of the space served by evaporator(s). (ft ²)					
B	Design cooling capacity for the space served by evaporators. (Btu/hr)					
C	B / A. Exempt if C > 240 Btu/hr-ft ²					
Evaporator fans served by a single compressor without variable capacity shall utilize controls to reduce airflow by at least 40% for at least 75% of the time when the compressor is not running.		§120.6(a)3C				
Exception 1 to §120.6(a)3C. Exempted evaporators in a refrigerated warehouse that are designed solely for the purpose of quick chilling or freezing of products. (space with design cooling capacities of greater than 240 Btu/hr-ft ²)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Fill in the reference to the sheet number and/or specification section and paragraph number where the required features are documented. If a requirement is not applicable, put "N/A" in the column next to the applicable section.						

Mandatory Infiltration Barriers					
Barrier Name ¹	Area ²	Purpose of Opening ³	Exempt? ⁴		Barrier Type ⁵
			Yes	No	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	

REFRIGERATED WAREHOUSE 3000 FT² OR GREATER

CEC-NRCC-PRC-07-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-PRC-07-E
Refrigerated Warehouse \geq 3,000 ft ²	(Page 3 of 3)
Project Name:	Date Prepared:

			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	

1. Enter the name of the infiltration barrier as identified in the building plans.
2. Enter the area of the opening that the infiltration barrier will fill.
3. Is the opening a dock, passageway between a freezer and a higher temperature space, passageway between a cooler and a non-refrigerated space, passageway between two freezers, or a passageway between two coolers?
4. The barrier is exempt from §120.6(a)6 if it is a dock doorway for trailers or if the opening is less than 16 ft². §120.6(a)6 does not apply to the barrier if the passageway is between two freezers or two coolers.
5. Is the infiltration barrier strip curtains, an automatically-closing door, or an air curtain? If the barrier is exempt, enter N/A.
6. If the barrier is exempt or complies with §120.6(a)6 enter Pass, otherwise enter Fail.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

REFRIGERATED WAREHOUSE 3000 FT² OR GREATER AND SERVED BY THE SAME REFRIGERATION SYSTEM

CEC-NRCC-PRC-08-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE - DATA FIELD DEFINITIONS AND CALCULATIONS

NRCC-PRC-08-E

Refrigerated Warehouse $\geq 3,000$ ft² and served by the same refrigeration system

(Page 1 of 5)

This form required when multiple spaces for refrigerated warehouses when equal to or more than 3,000 ft² of refrigerated space is served by the same refrigeration system compressor(s) and condenser(s).

MANDATORY MEASURES	Title 24 Sections	Indicate page reference for information on the plans or specification, or list the information below ¹				
Condenser ID or tags (e.g. Cond-1)						
Minimum condensing temperature setpoint $\leq 70^{\circ}\text{F}$.						
Condenser fans must be continuously variable speed and all fans on a common high side are to be controlled in unison.	§120.6(a) 4C,D					
The condensing temperature setpoint for air-cooled condensers must be reset in response to ambient drybulb temperature. The condensing temperature setpoint for evaporative-cooled condensers or water-cooled condensers (via cooling towers or fluid coolers) shall be reset in response to ambient wetbulb temperatures.	§120.6(a) 4E					
Exception to §120.6(a)4E. Condensing temperature control strategies approved by the Executive Director that have been demonstrated to provide at least equal energy savings. Attach letter of approval to form.						
Minimum allowed condenser specific efficiency. (Reference Table 120.6-B)						
Installed condenser specific efficiency (Reference PRC-08-E Page 3 or 4)	§120.6(a) 4F					
Is the installed condenser efficiency \geq the minimum allowed condenser efficiency?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is an evaporative condenser or water-cooled condenser served by a fluid cooler or cooling tower installed? If Yes then fill out the next 5 lines.	§120.6(a) 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Design wetbulb (WB) temperature ($^{\circ}\text{F}$).						
Saturated condensing temperature (SCT) under design conditions ($^{\circ}\text{F}$).						
Maximum allowed SCT under design conditions WB $\leq 76^{\circ}\text{F}$ SCT = WB + 20°F $76^{\circ}\text{F} < \text{WB} \leq 78^{\circ}\text{F}$ SCT = WB + 19°F WB $> 78^{\circ}\text{F}$ SCT = WB + 18°F						
Exception to §120.6(a)4A. Exempted condenser is on a refrigeration system where more than 20% of the design refrigeration load is for quick chilling or freezing (space with design cooling capacities of greater than 240 Btu/hr-ft ²), or process refrigeration cooling for other than a refrigerated space.	§120.6(a) 4A					
Condenser exempt or is the installed condensing temperature \leq the maximum allowed condensing temperature?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Fill in the reference to the sheet number and/or specification section and paragraph number where the required features are documented. If a requirement is not applicable, put "N/A" in the column next to the applicable section.						

REFRIGERATED WAREHOUSE 3000 FT² OR GREATER AND SERVED BY THE SAME REFRIGERATION SYSTEM

CEC-NRCC-PRC-08-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE - DATA FIELD DEFINITIONS AND CALCULATIONS

NRCC-PRC-08-E

Refrigerated Warehouse $\geq 3,000$ ft² and served by the same refrigeration system

(Page 2 of 5)

MANDATORY MEASURES	Title 24 Sections	Indicate page reference for information on the plans or specification, or list the information below ¹				
Condenser ID or tags (e.g. Cond-1)						
Is an air-cooled condenser installed? If Yes then fill out the next 9 lines.	§120.6(a) 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Design drybulb (DB) temperature (°F)	§120.6(a) 4B					
Saturated condensing temperature (SCT) under design conditions (°F).						
Is condenser serving a cooler or freezer? (if both list freezer)						
Maximum allowed SCT under design conditions for systems serving cold storage. Freezer SCT = DB + 10°F Cooler SCT = DB + 15°F						
Exception 1 to §120.6(a)4B. Exempted condensing unit has a total compressor power < 100 HP.						
Exception 2 to §120.6(a)4B. Exempted air-cooled condenser is on a refrigeration system where more than 20% of the design refrigeration load is for quick chilling or freezing (space with design cooling capacities of greater than 240 Btu/hr-ft ²), or process refrigeration cooling for other than a refrigerated space.	§120.6(a) 4G					
Condenser or condensing units(s) exempt, or is the installed condensing temperature less than or equal to the maximum allowed condensing temperature?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the fin density < 10 fins per inch?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exception to §120.6(a)4G. Condenser is a micro-channel condenser.						
Compressor ID or tags (e.g. Comp-1)						
Compressors shall be designed to operate at a minimum condensing temperature of 70°F or less.	§120.6(a) 5A					
New open-drive screw compressors with a design saturated suction temperature (SST) $\leq 28^\circ\text{F}$ that discharges to the system condenser pressure shall control compressor speed in response to the refrigeration load.	§120.6(a) 5B					
Exception 1 to §120.6(a)5B. Exempted compressor is part of a multiple compressor suction group.						
Exception 2 to §120.6(a)5B. Exempted compressor(s) is part of a system where more than 20% of the design refrigeration load is for quick chilling or freezing (space with design cooling capacities of greater than 240 Btu/hr-ft ²), or process refrigeration cooling for other than a refrigerated space.						
1. Fill in the reference to the sheet number and/or specification section and paragraph number where the required features are documented. If a requirement is not applicable, put "N/A" in the column next to the applicable section.						

**REFRIGERATED WAREHOUSE 3000 FT² OR GREATER AND
SERVED BY THE SAME REFRIGERATION SYSTEM**

CEC-NRCC-PRC-08-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE - DATA FIELD DEFINITIONS AND CALCULATIONS

NRCC-PRC-08-E

Refrigerated Warehouse $\geq 3,000$ ft² and served by the same refrigeration system

(Page 3 of 5)

Condenser Efficiency Worksheet
☐ WATER-COOLED CONDENSER SERVED BY A FLUID COOLER (EXEMPT)

☐ EVAPORATIVE CONDENSER

Tag/ ID	Fans				Pumps				Condenser		
	A	B	C	D	E	F	G	H	I	J	K
	Motor Power (HP) ¹	Motor Efficiency (%) ²	Motor Input Power (kW) (0.746 x A/B)	Total Fan Power (kW)	Motor Power (HP)	Motor Efficiency (%) ²	Motor Input Power (kW) ³ (0.746 x E/F)	Total Pump Power (kW)	Capacity (MBH) ⁴	Total Input Power (kW) D + H	Specific Efficiency (Btuh / Watt) I / J
	1 ____	1 ____	1 ____								
	2 ____	2 ____	2 ____		1 ____	1 ____	1 ____				
	3 ____	3 ____	3 ____		2 ____	2 ____	2 ____				
	4 ____	4 ____	4 ____		3 ____	3 ____	3 ____				
	5 ____	5 ____	5 ____		4 ____	4 ____	4 ____				
	6 ____	6 ____	6 ____								
	1 ____	1 ____	1 ____								
	2 ____	2 ____	2 ____		1 ____	1 ____	1 ____				
	3 ____	3 ____	3 ____		2 ____	2 ____	2 ____				
	4 ____	4 ____	4 ____		3 ____	3 ____	3 ____				
	5 ____	5 ____	5 ____		4 ____	4 ____	4 ____				
	6 ____	6 ____	6 ____								
	1 ____	1 ____	1 ____								
	2 ____	2 ____	2 ____		1 ____	1 ____	1 ____				
	3 ____	3 ____	3 ____		2 ____	2 ____	2 ____				
	4 ____	4 ____	4 ____		3 ____	3 ____	3 ____				
	5 ____	5 ____	5 ____		4 ____	4 ____	4 ____				
	6 ____	6 ____	6 ____								

1. Enter the horsepower for each fan motor. If the manufacturer specifies the input power in kW, then skip to column C and enter it there.

2. Enter efficiency as decimal for calculations. Example: 92.5% = 0.925

3. Enter the horsepower for each pump motor. If the manufacturer specifies the input power in kW, then skip to column G and enter it there.

4. Enter the manufacturer's published capacity, with any required adjustment factors for the application, of the condenser at 100°F saturated condensing temperature and 70°F ambient wetbulb temperature.



Condenser Efficiency Worksheet

□ AIR-COOLED CONDENSER

[illegible]

1. Enter the horsepower for each fan motor. If the manufacturer specifies the input power in kW, then skip to column D and enter it there.
2. Enter efficiency as decimal for calculations. Example: 92.5% = 0.925
3. Enter the manufacturer's published capacity, with any required adjustment factors for the application, of the condenser at 105°F saturated condensing temperature and 95°F ambient drybulb temperature (10°F temperature difference).

REFRIGERATED WAREHOUSE 3000 FT² OR GREATER AND SERVED BY THE SAME REFRIGERATION SYSTEM

CEC-NRCC-PRC-08-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE - DATA FIELD DEFINITIONS AND CALCULATIONS

NRCC-PRC-08-E

Refrigerated Warehouse $\geq 3,000$ ft² and served by the same refrigeration system

(Page 5 of 5)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
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Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:



CERTIFICATE OF COMPLIANCE		NRCC-PRC-09-E
Laboratory Exhaust		(Page 1 of 1)
Project Name:	Date Prepared:	

System air flow as designed : _____ **ACH**

Equipment Tags and System Description ²				
PRESCRIPTIVE MEASURES	T-24 Sections	Reference to the Requirements in the Contract Documents³		
Exhaust system with VAV hood	140.9(c)			
Exhaust system without VAV hood – Exc. 1e	140.9(c) Exception 1			
Exhaust system without VAV hood – Exc. 1e	140.9(c) Exception 2			

Notes:

1. Enter the designed system air flow rate in Air Changes per Hour (ACH) for all Laboratory systems under this permit.
2. Provide equipment tags (e.g. EF-1 to x and AHU 1 to y) for all systems that are covered by these requirements. This includes systems that are VAV flow Hoods as well as system that are exempted as per sections 1 or 2 under section 140.9 (c).
3. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system. Explicitly list which exception is used (if used).

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

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4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
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Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

COMPRESSED AIR SYSTEM

CEC-NRCC-PRC-10-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-PRC-10-E
Compressed Air System	(Page 1 of 3)
Project Name:	Date Prepared:

General Information	
Phase of Construction:	<input type="checkbox"/> New Construction <input type="checkbox"/> Addition/Alteration
Total System Horsepower:	Proposed: _____ hp Current: _____ hp (if applicable)
<ul style="list-style-type: none"> <i>If in Addition/Alteration phase of construction and proposed total system horsepower is ≤ 1.5 multiplied by the current total system horsepower, system is exempt from Trim Compressor and Storage requirement (§120.6(e)1).</i> <i>If in Addition/Alteration phase of construction and system includes one or more centrifugal compressors, system is exempt from Title 24 requirements (§120.6(e)).</i> <i>If proposed total system horsepower is < 25 hp, system is exempt from Title 24 requirements (§120.6(e)).</i> 	
Is the system expected to have a steady load (typical air demand fluctuates less than 10 percent)? <input type="checkbox"/> Yes <input type="checkbox"/> No (Note: If Yes, system must be approved by the Energy Commission Executive Director.)	
Is the system a single compressor system? <input type="checkbox"/> Yes <input type="checkbox"/> No (Note: If Yes, system is exempt from Controls requirement (§120.6(e)2).)	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

COMPRESSED AIR SYSTEM

CEC-NRCC-PRC-10-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-PRC-10-E
Compressed Air System	(Page 2 of 3)
Project Name:	Date Prepared:

Trim Compressor and Storage Requirements								
<i>Fill out the following sections to ensure compliance with Trim Compressor and Storage requirement (§120.6(e)1).</i>								
System Specifications Table								
Total Online System Capacity (acfm):					Operating Pressure (psi):			
Compressor Specifications:								
Compressor	Size (hp)	Rated Capacity (acfm)	Control Type (check one or fill-in for 'Other')					Acting as Trim Compressor?
			Fixed Speed	Variable Displacement	Variable Speed	Centrifugal	Other	
1								Y / N
2								Y / N
3								Y / N
4								Y / N
5								Y / N
6								Y / N
7								Y / N
8								Y / N
9								Y / N
10								Y / N
If number of compressors exceeds 10, please list the additional compressors with specifications in the following Notes section.								
Notes:								
Largest Net Capacity Increment:			acfm (Note: This calculation is detailed in the compliance manual section 10.6, where the largest net capacity increment is the largest step in capacity between ordered combinations of base compressors.)					
Do all of the trim compressors have the control type Variable Speed?								Results
<input type="checkbox"/> Yes	If Yes, calculate the total rated capacity of the trim compressor(s),							
	Total Rated Capacity of Trim Compressor(s): acfm							Y / N
	Is the total rated capacity of the trim compressor(s) greater than or equal to 1.25 multiplied by the largest net capacity increment?							
<input type="checkbox"/> No	Storage Capacity: gallons							Y / N
	Is the storage capacity greater than or equal to 1 gallons/acfm multiplied by the total rated capacity of the trim compressor(s)?							
	If No, calculate the effective trim capacity of the trim compressor(s).							
Effective Trim Capacity: acfm								
Is the total effective trim capacity greater than or equal to the largest net capacity increment? (Note: This calculation is detailed in the compliance manual, section 10.6)								
<input type="checkbox"/> No	Storage Capacity: gallons							Y / N
	Is the storage capacity greater than or equal to 2 gallons/acfm multiplied by the total rated capacity of the trim compressor(s)?							

Controls Requirement	Results
<i>Multicompressor systems must perform and document the acceptance test noted below to prove compliance with the Controls requirement (§120.6(e)2). This test is described in the Nonresidential Appendices, NA7.13.</i>	
PROC-01 A	Test Performed By: PASS / FAIL

SOLAR READY AREAS

CEC-NRCC-SRA-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-SRA-01-E
Solar-Ready Areas		(Page 1 of 2)
Project Name:	Date Prepared:	

General Information	
Project Address:	
Building Type: <input type="checkbox"/> Hotel/Motel building with ten stories or fewer <input type="checkbox"/> High-rise multi-family building with ten stories or fewer <input type="checkbox"/> Other nonresidential building with three stories or fewer	
Solar-ready requirements do not apply to hotel/motel buildings and high-rise multifamily building with more than ten stories or other nonresidential buildings with more than three stories.	
Type of Construction: <input type="checkbox"/> New Construction <input type="checkbox"/> Addition that increases roof area by more than 2,000 ft ² Solar-ready requirements do not apply to alterations or additions that increase the roof area by 2,000 ft² or less.	

Solar-Ready Choose Path A, B, C, D, or E from below	
<input checked="" type="checkbox"/> A. Allocated Solar Zone	
NRCC-SRA-02-E Minimum Solar Zone Area Worksheet is required to be submitted	
Minimum Solar Zone Area (sqft)	
This is quantity [G] from NRCC-SRA-02-E Minimum Solar Zone Area Worksheet	
Proposed Solar Zone Area (sqft)	
This is quantity [S] from NRCC-SRA-02-E Minimum Solar Zone Area Worksheet	
The construction documents will indicate a location for inverters and metering equipment and a pathway for routing of conduit from the solar zone to the point of interconnection with the electrical service. The construction documents will indicate a pathway for routing of plumbing from the solar zone to the water heating system.	
A copy of the construction documents or a comparable document indicating information about the solar zone and interconnection pathways will be provided to the occupant.	
If the installer certifies that all above requirements have been met and the Proposed Solar Zone Area meets or exceeds the Minimum Solar Zone Area, the building complies, otherwise it does not comply. <input type="checkbox"/> does not comply <input type="checkbox"/> complies 	

<input checked="" type="checkbox"/> B. Permanently Installed Solar Photovoltaic (PV) System		
Total Roof Area (sqft)* [A]	Minimum Nameplate DC Power Rating (watts) [B] = A x 1watt/ft²	
<i>* New construction: report total roof area; Additions: report newly added roof area</i>		
Will the proposed building have a permanently installed solar electric system that meets or exceeds the Minimum Nameplate DC Power Rating? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, a NRCI-SPV-01-E Certificate of Installation: Solar Photovoltaic System documenting the installed system must be submitted as a condition of final approval.		
Please check box to right if answered yes to all questions in this section. <input type="checkbox"/> EXEMPT		

<input checked="" type="checkbox"/> C. Permanently Installed Solar Water Heating System		
Will the building have a permanently installed solar water heating system? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, a NRCI-STH-01-E Certificate of Installation: Solar Water Heating System documenting the installed system must be submitted as condition of final approval.		
Is the annual solar savings fraction equal to or greater than 0.2 in climate zones 1 through 9 or 0.35 in climate zones 10 through 16? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Annual Solar Savings Fraction	How was Annual Solar Savings Fraction Calculated?	
Please check box to right if answered yes to all questions in this section. <input type="checkbox"/> EXEMPT		

SOLAR READY AREAS

CEC-NRCC-SRA-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE	NRCC-SRA-01-E
Solar-Ready Areas	(Page 2 of 2)
Project Name:	Date Prepared:

<input type="checkbox"/> D. Thermostats and High Efficacy Lighting	
Is the building a high-rise multifamily building with ten or stories or fewer?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Will all thermostats in each dwelling unit comply with Reference Joint Appendix 5 (JA5) and will they be capable of receiving and responding to Demand Response Signals prior to granting of an occupancy permit by the enforcing agency?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Will all installed luminaires be classified as high efficacy in accordance with the applicable requirements in Section 130.0(c), and in accordance with TABLE 150.0-A or TABLE 150.0-B?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Please check box to right if answered yes to all questions in this section. <input type="checkbox"/> EXEMPT	

<input type="checkbox"/> E. Roof is Designed for Vehicle Traffic or Parking or for Heliport	
Will the roof be designed and approved to be used for vehicular traffic or parking or for a heliport.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Please provide building plan reference _____.	
Please check box to right if answered yes to all questions in this section. <input type="checkbox"/> EXEMPT	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT	
I certify the following under penalty of perjury, under the laws of the State of California:	
1. The information provided on this Certificate of Compliance is true and correct.	
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).	
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.	
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.	
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

Instructions to Applicant Solar-ready Compliance & Worksheets (check box if worksheet are included)
<input type="checkbox"/> NRCC-SRA-01-E Certificate of Compliance: Solar-ready Area. <i>Required all submittals.</i>
<input type="checkbox"/> NRCC-SRA-02-E Certificate of Compliance: Minimum Solar Zone Area Worksheet. <i>Required for compliance path A.</i>
<input type="checkbox"/> NRCI-SPV-01-E Certificate of Installation: Solar Photovoltaic System <i>Required for compliance path B.</i>
<input type="checkbox"/> NRCI-STH-01-E Certificate of Installation: Solar Water Heating System <i>Required for compliance path C.</i>

MINIMUM SOLAR ZONE AREA WORKSHEET

CEC-NRCC-SRA-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-SRA-02-E
Minimum Solar Zone Area Worksheet		(Page 1 of 3)
Project Name:	Date Prepared:	

Solar Zone Area (requirements in §110.10(b)1B)

This worksheet applies to hotel/motel occupancies and high-rise multifamily buildings with ten stories or fewer, and all other nonresidential buildings with three stories or fewer that comply with the solar zone requirement through compliance path A: allocated solar zone.

The worksheet applies to all additions that increase the roof area by more than 2000 ft².

General Information**Project Address:**

Total Roof Area: ☐ Less than or equal to 10,000 ft²
☐ Greater than 10,000 ft²

Phase of Construction: ☐ New Construction
☐ Addition that increases roof area by more than 2,000 ft²

Step 1: Determine Minimum Solar Zone Area

Calculate the minimum solar zone area using one of the two options provided below. Use option 2 if your roofs and overhangs are shaded.

Method 1: Minimum Solar Zone Area Based on Total Roof Area (requirements in 110.10(b)1B)

New Construction: Total roof area (sqft)	A	
Additions: Total roof area added to building (sqft)		
New Construction: Area of roof covered with skylights(sqft)	B	
Additions: Area of new roof area covered with skylights(sqft)		
Minimum solar zone area	$C = 0.15 \times (A - B)$	

Note: For additions, if $A \leq 2,000 \text{ ft}^2$ then addition does not need to comply with solar zone requirements

Method 2: Minimum Solar Zone Area Based on Potential Solar Zone (requirements in Exception 3 to 110.10(b)1B)

The enforcement agency may require additional documentation that describes how the reduced solar zone area was determined.

Method/Tool(s) used to quantify annual solar access: (for example, "Software X", "CAD Tool Y")		
Area of low-sloped roof (ratio of rise to run of 2:12 or less) where the annual solar access is 70 percent or greater.* (sqft)	D	
Area of steep-sloped roof (ratio of rise to run is greater than 2:12) that is oriented between 110 and 270 degrees and annual solar access is 70 percent or greater.* (sqft)	E	
Minimum solar zone area	$F = 0.5 \times (D + E)$	

* For new construction consider total roof area; for additions consider newly added roof area

Minimum solar zone area (either C or F) (sqft)	G	
--	---	--

MINIMUM SOLAR ZONE AREA WORKSHEET

CEC-NRCC-SRA-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

**CERTIFICATE OF COMPLIANCE**

NRCC-SRA-02-E

Minimum Solar Zone Area Worksheet

(Page 2 of 3)

Project Name:

Date Prepared:

Step 2: Allocated Solar Zone Subareas

Subarea ID	Building Plan Reference	Slope of Roof or Overhang	If Steep Slope, roof or overhang oriented between 110 and 270 degrees	Subarea complies with Part 9 of Title 24 ^A	Subarea is free of obstructions ^B	Subarea is located the appropriate distance from obstructions ^C	Smallest dimension is greater than 5 feet	Subarea meet minimum area requirement ^D	Subarea Qualifies ^E	Area (sqft)
H	I	J	K	L	M	N	O	P	Q	R
		<input type="checkbox"/> Low <input type="checkbox"/> Steep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
		<input type="checkbox"/> Low <input type="checkbox"/> Steep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
		<input type="checkbox"/> Low <input type="checkbox"/> Steep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
		<input type="checkbox"/> Low <input type="checkbox"/> Steep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
		<input type="checkbox"/> Low <input type="checkbox"/> Steep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
		<input type="checkbox"/> Low <input type="checkbox"/> Steep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
		<input type="checkbox"/> Low <input type="checkbox"/> Steep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
		<input type="checkbox"/> Low <input type="checkbox"/> Steep	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Proposed Solar Zone Area (sqft) (sum of all qualifying subareas) [S]										

- A. The solar zone shall comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other Parts of Title 24 or in any requirements adopted by a local jurisdiction.
- B. No obstructions, including but not limited to, vents, chimneys, architectural features, and roof mounted equipment, shall be located in the solar zone.
- C. Solar zone must be located no closer than twice the distance, measured in the horizontal plane, of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane.
- D. If building roof area $\leq 10,000 \text{ ft}^2$ then minimum area is 80ft^2 . If building roof area $>10,000 \text{ ft}^2$ then minimum area is 160ft^2 .
- E. Check "yes" if answers to questions in columns K through P are "yes".

☐ **Building Complies with Minimum Solar Zone Area Requirement**

Check box if Proposed Solar Zone Area [S] is equal to or greater than the Minimum Solar Zone Area [G]

MINIMUM SOLAR ZONE AREA WORKSHEET

CEC-NRCC-SRA-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-SRA-02-E
Minimum Solar Zone Area Worksheet		(Page 3 of 3)
Project Name:	Date Prepared:	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> 1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

OG 100 SOLAR WATER HEATING WORKSHEET

CEC-NRCC-STH-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE		NRCC-STH-01-E
OG 100 Solar Water Heating Worksheet		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

A. General System Information		
01	Water Heating System Name	
02	Climate Zone	
03	Collector Manufacturer	
04	Collector Brand	
05	Collector Model Number	
06	SRCC Certification Number	
07	Name of Program Used to generate solar thermal performance	
08	Version of software used	
09	Collector Type	
10	Collector Area in ft ²	
11	Collector Rated Efficiency Curve Slope	
12	Collector Rated Efficiency Curve Intercept	
13	Number of Collectors	
14	Collector Fluid	
15	Water Heater Storage Volume in gallons	
16	Secondary Storage Tank Volume in gallons (If used)	
17	Collector angle from true north in degrees	
18	Collector slope from horizontal in degrees	
19	Floor area of building in ft ²	
20	Number of identical dwelling units	
21	Calculated Solar Fraction	



CERTIFICATE OF COMPLIANCE		NRCC-STH-01-E
OG 100 Solar Water Heating Worksheet		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. 	
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS		NRCC-STH-01-E
OG 100 Solar Water Heating Worksheet		(Page 1 of 1)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

- 01 Water Heating System Name: Enter the name of the water heating system.
- 02 California Climate Zone: Enter the climate zone the project was performed for.
- 03 Collector Manufacturer: Enter the name of the collector manufacturer
- 04 Collector Brand: Enter the Brand name of the collector if different than the Manufacturer.
- 05 Collector Model Number: Enter the collector model number as listed in the SRCC directory
- 06 SRCC Certification Number: Enter the SRCC Certification Number from the SRCC directory
- 07 Name of Program Used to generate solar thermal performance: Enter the name of the solar thermal simulation tool used. If other than California F-chart the program must be approved for use by the Commission
- 08 Version of software used: Enter if applicable the version of the simulation tool used.
- 09 Collector Type: Enter the collector type listed in the SRCC directory
- 10 Collector Area (sq ft): Enter the listed square footage of the collector as listed in the SRCC directory.
- 11 Collector Rated Efficiency Curve Slope: Enter the slope of the collector listed in the SRCC directory
- 12 Collector Rated Efficiency Curve intercept: Enter the intercept of the collector listed in the SRCC directory
- 13 Number of Collectors: Enter the number of collectors included in the simulation run.
- 14 Collector Fluid: Enter the type of fluid used in the collector (i.e. water, glycol, air).
- 15 Water Heater Storage Volume: Enter the number of gallons of fluid in the primary water heater storage tank.
- 16 Secondary Storage Tank Volume: IF applicable enter the volume of the secondary tank used for solar storage; this may include more than one tank.
- 17 Collector angle from true north in degrees: Enter the angle of the collectors from true north used in simulation. Note in calculating the angle be sure to include the regions magnetic declination.
- 18 Collector slope form horizontal in degrees: Enter the slope of the collectors from horizontal as used in the simulation.
- 19 Floor area of building: Enter the square footage of the building.
- 20 Number of identical dwelling units: Enter the number of units in the building
- 21 Calculated Solar Fraction: Enter the average annual solar fraction, or note that hourly data was used.

CERTIFICATE OF COMPLIANCE - DATA FIELD DEFINITIONS AND CALCULATIONS		NRCC-STH-01-E
OG 100 Solar Water Heating Worksheet		(Page 1 of 1)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

Solar Fractions Water Heating Calculation for Built up Equipment

A. General System Information		
01	Water Heating System Name	<<text (user input)>>
02	Climate Zone	<<numeric (user input)>>
03	Collector Manufacturer	<<text (user input)>>
04	Collector Brand	<<text (user input)>>
05	Collector Model Number	<<text (user input)>>
06	SRCC Certification Number	<<text (user input)>>
07	Name of Program Used to generate solar thermal performance	<<text (user input)>>
08	Version of software used	<<text (user input)>>
09	Collector Type	<<text (user input)>>
10	Collector Area in ft ²	<<numeric xxx (user input)>>
11	Collector Rated Efficiency Curve Slope	<<text (user input)>>
12	Collector Rated Efficiency Curve Intercept	<<text (user input)>>
13	Number of Collectors	<<numeric xx (user input)>>
14	Collector Fluid	<<text (user input)>>
15	Water Heater Storage Volume in gallons	<<numeric xx,xxx (user input)>>
16	Secondary Storage Tank Volume in gallons (If used)	<<numeric xx,xxx (user input)>>
17	Collector angle from true north in degrees	<<text (user input)>>
18	Collector slope form horizontal in degrees	<<text (user input)>>
19	Floor area of building in ft ²	<<numeric xx,xxx (data from certificate of compliance)>>
20	Number of identical dwelling units	<<numeric xxx (data from certificate of compliance)>>
21	Calculated Solar Fraction	<<text (user input)>>





CERTIFICATE OF INSTALLATION		NRCI-ELC-01-E
Electrical Power Distribution		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DATE OF BUILDING PERMIT		PERMIT #		
BUILDING TYPE	<input type="checkbox"/> Nonresidential	<input type="checkbox"/> High-Rise Residential	<input type="checkbox"/> Hotel/Motel Guest Room	
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration	<input type="checkbox"/> Unconditioned
<i>If more than one person has responsibility for building construction, each person shall prepare and sign an Installation Certificate document applicable to the portion of construction for which they are responsible; alternatively, the person with chief responsibility for construction shall prepare and sign the Installation Certificate document(s) for the entire construction.</i>				

Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate.	Date:
--	-------

[illegible]



CERTIFICATE OF INSTALLATION		NRCI-ENV-01-E
Envelope		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> 1. The information provided on this Certificate of Installation is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. 3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. 4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. 5. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

[illegible]



CERTIFICATE OF INSTALLATION		NRCI-LTI-01-E
Indoor Lighting		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
1. The information provided on this Certificate of Installation is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. 3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. 4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. 5. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:



CERTIFICATE OF INSTALLATION		NRCI-LTI-02-E
Energy Management Control System or Lighting Control System		(Page 1 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION				
DATE OF BUILDING PERMIT		PERMIT #		
BUILDING TYPE	<input type="checkbox"/> Nonresidential	<input type="checkbox"/> High-Rise Res (Common Area)	<input type="checkbox"/> Hotel/Motel (Common Area)	
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration	<input type="checkbox"/> Unconditioned

SCOPE OF RESPONSIBILITY	
Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate.	Date:

Requirements in the Standards:

§130.4(b) Before an Energy Management Control System (EMCS), or Lighting Control System can be recognized for compliance with the lighting control requirements in Part 6 of Title 24, the person who is eligible under Division 3 of the Business and Professions Code to accept responsibility for the construction or installation of features, materials, components, or manufactured devices shall sign and submit this Installation Certificate.

If any of the requirements in this Installation Certificate fail the Energy Management Control System or Lighting Control System installation requirements, these options for controlling lighting shall not be recognized for compliance with the Building Energy Efficiency Standards.

Check all that apply:

PART 1 What type of Lighting Control System has been installed?

- ☐ **A. Energy Management Control System (EMCS)** - Is a computerized control system designed to regulate the energy consumption of a building by controlling the operation of energy consuming systems, such as the heating, ventilation and air conditioning (HVAC), lighting, and water heating systems, and is capable of monitoring environmental and system loads, and adjusting HVAC operations in order to optimize energy usage and respond to demand response signals.
- ☐ The Energy Management Control System has been installed to function as a lighting control required by Part 6 and functionally meets all applicable requirements for each application for which it is installed, in accordance with Sections 110.9, 130.0 through 130.5, 140.6 through 150.0, and 150.2; and complies with Reference Nonresidential Appendix NA7.7.2.
- ☐ The EMCS has been separately tested for each respective lighting control system for which it is installed to function as.
- ☐ **B. Lighting Control System** - Requires two or more components to be installed in the building to provide all of the functionality required to make up a fully functional and compliant lighting control.
- ☐ The installed Lighting Control System complies with the requirements checked below; and all components of the system considered together as installed meet all applicable requirements for the application for which



CERTIFICATE OF INSTALLATION		NRCI-LTI-02-E
Energy Management Control System or Lighting Control System		(Page 2 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

they are installed as required in Sections 130.0 through 130.5, Sections 140.6 through 140.8, Section 141.0, and Section 150.0(k).

PART 2 Lighting Control Functional requirements: *Check all that apply when verifying the installation of an EMCS or Lighting Control System.*

- ☐ A. All lighting controls and equipment have been installed in accordance with the manufacturer's instructions.
- ☐ B. The manufacturer has provided instructions for calibration.
- ☐ C. If indicator lights are integral to any components, such indicator lights consumes no more than 1 watt of power per indicator light.
- ☐ D. Components that are regulated by the Title 20 Appliance Efficiency Regulations have been certified to the Energy Commission.
- ☐ E. The EMCS or Lighting Control System functions as one or more of the Time-Switch Lighting Controls checked below, and complies with all of the following requirements:
 - ☐ 1. Automatic Time-Switch Controls meeting all requirements for Automatic Time Switch Control devices in the Title 20 Appliance Efficiency Regulations, including the requirements below:
 - a. Residential automatic time-switch controls have program backup capabilities that prevent the loss of the device's schedule for at least 7 days, and the device's date and time for at least 72 hours if power is interrupted.
 - b. Commercial automatic time-switch controls meet the following requirements:
 - i. Has program backup capabilities that prevent the loss of the device's schedule for at least 7 days, and the device's date and time for at least 72 hours if power is interrupted;
 - ii. Is capable of providing manual override to each connected load and shall resume normally scheduled operation after manual override is initiated within 2 hours for each connected load; and
 - iii. Incorporates an automatic holiday shutoff feature that turns off all connected loads for at least 24 hours and then resumes normally scheduled operation.
 - ☐ 2. Astronomical Time-Switch Controls meeting all requirements for Astronomical Time-Switch Control devices in the Title 20 Appliance Efficiency Regulations, including the requirements below:
 - a. Meets the requirements of an automatic time-switch control;
 - b. Has sunrise and sunset prediction accuracy within plus-or-minus 15 minutes and timekeeping accuracy within 5 minutes per year;
 - c. Is capable of displaying date, current time, sunrise time, sunset time, and switching times for each step during programming;
 - d. Has an automatic daylight savings time adjustment; and
 - e. Has the ability to independently offset the on and off for each channel by at least 99 minutes before and after sunrise or sunset.
 - ☐ 3. Multi-Level Astronomical Time-Switch Controls, in addition to meeting all of the requirements for Astronomical Time-Switch Controls, includes at least 2 separately programmable steps per zone.



CERTIFICATE OF INSTALLATION		NRCI-LTI-02-E
Energy Management Control System or Lighting Control System		(Page 3 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- ☐ F. The EMCS or Lighting Control System functions as one or more of the Daylighting Controls listed below:
- ☐ 1. Automatic Daylight Controls meet all requirements for Automatic Daylight Control devices in the Title 20 Appliance Efficiency Regulations, including the following:
 - a. Is capable of reducing the power consumption in response to measured daylight either directly or by sending and receiving signals;
 - b. If the system includes a dimmer, complies with the Dimmer Control device requirements in the Title 20 Appliance Efficiency Regulations.
 - c. Automatically return to its most recent time delay settings within 60 minutes when put in calibration mode;
 - d. Has a set point control that easily distinguishes settings to within 10 percent of full scale adjustment;
 - e. Has a light sensor that has a linear response within 5 percent accuracy over the range of illuminance measured by the light sensor;
 - f. Has a light sensor that is physically separated from where the calibration adjustments are made, or is capable of being calibrated in a manner that the person initiating the calibration is remote from the sensor during calibration to avoid influencing calibration accuracy; and
 - g. Complies with the Title 20 requirements for photo controls if the system contains a photo control component.
 - ☐ 2. Photo Controls meet all requirements for Photo Control devices in the Title 20 Appliance Efficiency Regulations, including the following that it does not have a mechanical device that permits disabling of the control.
- ☐ G. The EMCS or Lighting Control System functions as a Dimmer and meets all requirements for a Dimmer Control device in the Title 20 Appliance Efficiency Regulations, including the following:
- 1. Is capable of reducing power consumption by a minimum of 65 percent when the dimmer is at its lowest level;
 - 2. Includes an off position which produces a zero lumen output; and
 - 3. Does not consume more than 1 watt per lighting dimmer switch leg when in the off position.
 - 4. Dimmer controls that can directly control lamps provide electrical outputs to lamps for reduced flicker operation through the dimming range so that the light output has an amplitude modulation of less than 30 percent for frequencies less than 200 Hz without causing premature lamp failure.
 - 5. If designed for use in three way circuits is capable of turning lights off, and to the level set by the dimmer if the lights are off.
- ☐ H. The EMCS or Lighting Control System meets the following requirements:
- 1. Is capable of automatically turning off controlled lights in the area no more than 30 minutes after the area has been vacated;
 - 2. Allows all lights to be manually turned off regardless of the status of occupancy; and
 - 3. Has a visible status signal that indicates that the device is operating properly, or that it has failed or malfunctioned. The visible status signal may have an override switch that turns off the signal.
 - 4. All occupant sensing devices that utilize ultrasonic radiation for detection of occupants meet the Ultrasound Maximum Decibel Values in the Title 20 Appliance Efficiency Regulations



CERTIFICATE OF INSTALLATION		NRCI-LTI-02-E
Energy Management Control System or Lighting Control System		(Page 4 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

5. All occupant sensing devices that utilize microwave radiation for detection of occupants meet the radiation requirements in the Title 20 Appliance Efficiency Regulations
6. Occupant sensing devices incorporating dimming comply with the requirements for dimmer controls in the Title 20 Appliance Efficiency Regulations
7. The EMCS or Lighting Control System functions as one or more of the Occupant Sensing Controls Checked Below:

- ☐ a. Occupant Sensors meeting all applicable requirements for Occupant Sensor Control devices in the Title 20 Appliance Efficiency Regulations
- b. Motion Sensors meeting all applicable requirements for Motion Sensor Controls devices in the Title 20 Appliance Efficiency Regulations, including that motion sensors are rated for outdoor use.
 - ☐ c. Vacancy Sensors meeting all applicable requirements for Vacancy Sensor Controls devices in the Title 20 Appliance Efficiency Regulations, including the following:
 - i. Does not turn on lighting automatically and does not incorporate DIP switches, or other manual means, for conversion between manual and automatic functionality;
 - ii. Has a grace period of no more than 30 seconds and no less than 15 seconds to turn on lighting automatically after the sensor has timed out; and
 - iii. Does not have an override switch that disables the sensor.
 - ☐ d. Partial-ON Sensors meeting all applicable requirements for partial on sensing devices in the Title 20 Appliance Efficiency Regulations, including the following:
 - i. Has two poles each with automatic-off functionality;
 - ii. Has one pole that is manual-on and does not incorporate DIP switches, or other manual means, for conversion between manual and automatic functionality; and
 - iii. Has one pole that is automatic-on and is not be capable of conversion by the user to manual-on functionality.
 - ☐ e. Partial-OFF Sensors meet all applicable requirements for partial off sensing devices in the Title 20 Appliance Efficiency Regulations, including the following:
 - i. Has two poles;
 - ii. Has one pole that is manual-on and manual off; and
 - iii. Has one pole that is automatic-on and automatic-off and is not capable of conversion by the user to manual-on only functionality.
 - ☐ f. Occupant Sensing Control systems consist of a combination of single or multi-level Occupant, Motion, or Vacancy Sensor Controls, and all components installed to comply with manual-on requirements are not capable of conversion by the user from manual-on to automatic-on functionality.

PART 3 Requirements for which the control is being installed to complied with:

Identify all requirements in the Standards for which the EMCS or Lighting Control System is installed to function as and complies with:

Check all that are applicable

- ☐ A. Section 130.1(a) Area Controls.
- ☐ B. Section 130.1(b) Multi-Level Lighting Controls
- ☐ C. Section 130.1 (c) Shut-OFF Controls
- ☐ D. Section 130.1 (d) Automatic Daylighting Controls.
- ☐ E. Section 130.1 (e) Demand Responsive Controls.
- ☐ F. Section 130.5 (d) Circuit Controls for 120-Volt Receptacles.



CERTIFICATE OF INSTALLATION		NRCI-LTI-02-E
Energy Management Control System or Lighting Control System		(Page 5 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

If installed to qualify for a Power Adjustment Factor, submit this Installation Certificate in addition to the PAF Installation Certificate.

- ☐ G. To qualify for the PAF for a Partial-ON Occupant Sensing Control in TABLE 140.6-A
- ☐ H. To qualify for the PAF for an occupant sensing control controlling the general lighting in large open plan office areas above workstations, in accordance with TABLE 140.6-A
- ☐ I. To qualify for the PAF for a Manual Dimming System PAF or a Multiscene Programmable Dimming System PAF in TABLE 140.6-A
- ☐ J. To qualify for the PAF for a Demand Responsive Control in TABLE 140.6-A
- ☐ K. To qualify for the PAF for Combined Manual Dimming plus Partial-ON Occupant Sensing Control in TABLE 140.6-A

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

TRACK LIGHTING INTEGRAL CURRENT LIMITER OR SUPPLEMENTARY OVERCURRENT PROTECTION PANEL

CEC-NRCI-LTI-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-03-E
Track Lighting Integral Current Limiter or Supplementary Overcurrent Protection Panel		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION				
DATE OF BUILDING PERMIT		PERMIT #		
BUILDING TYPE	<input type="checkbox"/> Nonresidential	<input type="checkbox"/> High-Rise Res (Common Area)	<input type="checkbox"/> Hotel/Motel (Common Area)	
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration	<input type="checkbox"/> Unconditioned

SCOPE OF RESPONSIBILITY	
Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate:	Date:

Certified Integral Current Limiters, and Dedicated Supplementary Overcurrent Protection Panels Used to control Line-Voltage Track Lighting

§130.4(b) Before a Line-Voltage Track Lighting Integral Current Limiter or Supplementary Overcurrent Protection Panel will be recognized for compliance with the lighting requirements in Part 6 of Title 24, the person who is eligible under Division 3 of the Business and Professions Code to accept responsibility for the construction or installation of features, materials, components, or manufactured devices shall sign and submit this Installation Certificate.

If any of the following requirements fail to comply with any of the Line-Voltage Track Lighting installation requirements, these methods for determining installed lighting power shall not be used for compliance with the Building Energy Efficiency Standards.

Check all that apply:

PART 1 Type of Line-Voltage Track Lighting Control Installed:

☐ A. Certified Line-Voltage Track Lighting Integral Current Limiter:

A Line-Voltage Track Lighting Integral Current Limiter that has been certified to the Energy Commission, and consists of a current limiter integral to the end-feed housing of a manufactured line-voltage track lighting system.

☐ B. Dedicated Line-Voltage Track Lighting Supplementary Overcurrent Protection Panel:

A Track Lighting Supplementary Overcurrent Protection Panel is a Panelboard containing Supplementary Overcurrent Protection Devices as defined in Article 100 of the California Electric Code, and used only with line voltage track lighting.

PART 2 Complete this Section for a Certified Line-Voltage Track Lighting Integral Current Limiter

If any of the following requirements are not met, the Integral Current Limiter shall not be recognized for compliance with the Building Energy Efficiency Standards.

- ☐ A. The track lighting integral current limiter is certified to the Energy Commission in accordance with §110.9 and has been verified by checking the Energy Commission database.
- ☐ B. Installed wattage has been determined in accordance with §130.0(c) and the track lighting worksheet (compliance form NRCC-LTI-05-E) has been completed for all installed track lighting integral current limiters, and submitted to the building department.
- ☐ C. The track current limiter is used exclusively on the same manufacturer's track for which it is designed

TRACK LIGHTING INTEGRAL CURRENT LIMITER OR SUPPLEMENTARY OVERCURRENT PROTECTION PANEL

CEC-NRCI-LTI-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-03-E
Track Lighting Integral Current Limiter or Supplementary Overcurrent Protection Panel		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- ☐ D. The track current limiter is designed and installed so that the track current limiter housing is permanently attached to the track so that the system will be irreparably damaged if the integral track current limiter housing were to be removed after installation into the track. Methods of attachment may include but are not limited to one-way barbs, rivets, and one-way screws
- ☐ E. The track current limiter has identical volt-ampere (VA) rating of the track current limiter, as installed and rated for compliance with Title 24, Part 6, clearly marked on all of the following locations:
 1. So that it is visible for the building officials' field inspection without opening cover-plates, fixtures, or panels, and
 2. Permanently marked on the circuit breaker, and
 3. On a factory-printed label that is permanently affixed to a non-removable base-plate inside the wiring compartment.
- ☐ F. The track current limiter employs tamper resistant fasteners for the cover to the wiring compartment.
- ☐ G. The track current limiter has a conspicuous factory installed label permanently affixed to the inside of the wiring compartment warning against removing, tampering with, rewiring, or bypassing the device.
- ☐ H. Each electrical panel from which track lighting integral current limiters are connected has a factory printed label permanently affixed and prominently located, with the following information:

"NOTICE: Current limiting devices installed in track lighting integral current limiters connected to this panel shall only be replaced with the same or lower amperage. Adding track or replacement of existing current limiters with higher continuous ampere rating will void the track lighting integral current limiter certification, and will require re-submittal and re-certification of California Title 24, Part 6 compliance documentation."
- ☐ I. For installations where a total of five or less track current limiters are installed in a single building, all integral track current limiters have been inspected.
- ☐ J. For installations where a total of more than five track current limiters are installed in a single building, no less than five track current limiters have been inspected, up to five inspections for each 20 installed track current limiters.

PART 3 Complete this Section for Dedicated Line-Voltage Track Lighting Supplementary Overcurrent Protection Panels

If any of the following requirements are not met, the Dedicated Line-Voltage Track Lighting Supplementary Overcurrent Protection Panel shall not be recognized for compliance with the Building Energy Efficiency Standards.

Note that the Line-Voltage Track Lighting Supplementary Overcurrent Protection Panels are not required to be certified to the Energy Commission.

- ☐ A. Installed wattage has been determined in accordance with §130.0(c) and the track lighting worksheet (compliance form NRCC-LTI-05-E) has been completed for all installed track lighting supplementary overcurrent protection panels, and submitted to the building department.
- ☐ B. The Dedicated Line-Voltage Track Lighting Supplementary Overcurrent Protection Panels is Listed in accordance with Article 100 of the California Electric Code
- ☐ C. The Dedicated Line-Voltage Track Lighting Supplementary Overcurrent Protection Panels is used only for line-voltage track lighting.
- ☐ D. No Supplementary Overcurrent Protection Panels been used to determine installed wattage for any lighting system other than line-voltage track lighting.
- ☐ E. No other lighting or building power is connected to a Supplementary Overcurrent Protection Panel

TRACK LIGHTING INTEGRAL CURRENT LIMITER OR SUPPLEMENTARY OVERCURRENT PROTECTION PANEL

CEC-NRCI-LTI-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-03-E
Track Lighting Integral Current Limiter or Supplementary Overcurrent Protection Panel		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- ☐ F. The Dedicated Line-Voltage Track Lighting Supplementary Overcurrent Protection Panels is installed in an electrical equipment room, or permanently installed adjacent to the lighting panel board providing supplementary overcurrent protection for the track lighting circuits served by the supplementary over current protection pane
- ☐ G. There is a prominently labeled permanently attached to the panel by the manufacturer with the following information:

"NOTICE: This Panel for Track Lighting Energy Code Compliance Only. The overcurrent protection devices in this panel shall only be replaced with the same or lower amperage. No other overcurrent protective device have been added to this panel. Adding to, or replacement of existing overcurrent protective device(s) with higher continuous ampere rating, will void the panel listing and require re-submittal and re-certification of California Title 24, Part 6 compliance documentation."

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
1. The information provided on this Certificate of Installation is true and correct.		
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.		
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.		
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.		
5. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

TWO INTERLOCKED LIGHTING SYSTEMS

CEC-NRCI-LTI-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-04-E
Two Interlocked Lighting Systems		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION				
DATE OF BUILDING PERMIT		PERMIT #		
BUILDING TYPE	<input type="checkbox"/> Nonresidential	<input type="checkbox"/> High-Rise Res (Common Area)	<input type="checkbox"/> Hotel/Motel (Common Area)	
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration	<input type="checkbox"/> Unconditioned

SCOPE OF RESPONSIBILITY	
Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate.	Date:

Two Interlocked Lighting Systems

§130.4(b) - Before Two Interlocked Lighting Systems will be permitted for compliance with §140.6 of Part 6 of Title 24, the person who is eligible under Division 3 of the Business and Professions Code to accept responsibility for the construction or installation of features, materials, components, or manufactured devices shall sign and submit this Installation Certificate.

§140.6(a)1. Two interlocked lighting systems: No more than two lighting systems may be used for an area, and if there are two they must be interlocked. Where there are two interlocked lighting systems, the watts of the lower wattage system may be excluded from the actual indoor Lighting Power Density if:

- A. An Installation Certificate detailing compliance with §140.6(a)1 is submitted in accordance with §10-103 and §130.4; and
- B. The area or areas served by the interlocking systems is an auditorium, a convention center, a conference room, a multipurpose room, or a theater; and
- C. The two lighting systems are interlocked with a Nonprogrammable Double-Throw Switch to prevent simultaneous operation of both systems.

If any of the following requirements fail, all installed and all planned portable lighting in the function area shall be included in the Certificates of Compliance when determining the installed lighting power.

Check all that apply:

- ☐ The function area qualifies to install two interlocked lighting systems because it is **ONLY** one of the following types:
- ☐ Auditorium room
 - ☐ Convention center room
 - ☐ Conference room
 - ☐ Multipurpose room
 - ☐ Theater room
- ☐ There are no more than two interlocked lighting systems serving the space.
- ☐ The two lighting systems are interlocked with a non-programmable double throw switch to prevent simultaneous operation.

For compliance with Part 6, a Nonprogrammable Double-Throw Switch is an electrical switch commonly called a "single pole double throw" or "three-way" switch that is wired as a selector switch allowing one of two loads to be enabled. It can be a line voltage switch or a low voltage switch selecting between two

TWO INTERLOCKED LIGHTING SYSTEMS

CEC-NRCI-LTI-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-04-E
Two Interlocked Lighting Systems		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

relays. It cannot be overridden or changed in any manner that would permit both loads to operate simultaneously.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

POWER ADJUSTMENT FACTORS

CEC-NRCI-LTI-05-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-05-H
Power Adjustment Factors		(Page 1 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION				
DATE OF BUILDING PERMIT		PERMIT #		
BUILDING TYPE	<input type="checkbox"/> Nonresidential	<input type="checkbox"/> High-Rise Res (Common Area)	<input type="checkbox"/> Hotel/Motel (Common Area)	
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration	<input type="checkbox"/> Unconditioned

SCOPE OF RESPONSIBILITY	
Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate:	Date:

Power Adjustment Factor (PAF)

§130.4(b) - Before a Power Adjustment Factor will be allowed for compliance with Section 140.6 of Part 6 of Title 24, the person who is eligible under Division 3 of the Business and Professions Code to accept responsibility for the construction or installation of features, materials, components, or manufactured devices shall sign and submit this Installation Certificate.

§140.6(a) 2 - Reduction of wattage through controls. In calculating actual indoor Lighting Power Density, the installed watts of a luminaire providing general lighting in an area listed in TABLE 140.6-A may be reduced by the product of (i) the number of watts controlled as described in TABLE 140.6-A, times (ii) the applicable Power Adjustment Factor (PAF), if all of the conditions [in this Certificate of Installation are met]:

If any of the requirements in this Installation Certificate fail, the installation shall not be eligible for using the PAF.

Check all that apply:**PART 1 Certificate Of Compliance Correctly Filled Out**

- ☐ In addition to this Certificate of Installation, the PAF has been correctly document on page 2 of NRCC-LTI-02—E of the Certificate of Compliance submitted to the building department.

PART 2 Type of PAF☐ **A. This installation qualifies for the following PAFs:**

- ☐ 1. This installation qualifies for the PAF for a Partial-ON Occupant Sensing Control in TABLE 140.6-A because it meets all of the following requirements:
- ☐ a. The Partial-ON Occupant Sensing Control is use in only the following space types:
 - ☐ i, An area \leq 250 square feet enclosed by floor-to-ceiling partitions
 - ☐ ii. A classroom of any size
 - ☐ iii. A conference room of any size
 - ☐ iv. A waiting room of any size
 - ☐ b. The PAF used is 0.20
 - ☐ c. The control automatically deactivates all of the lighting power in the area within 30 minutes after the room has been vacated; and
 - ☐ d. The first stage automatically activates between 30-70 percent of the lighting power in the area
 - ☐ e. The lighting control is a:
 - ☐ i. Switching system, or



CERTIFICATE OF INSTALLATION		NRCI-LTI-05-H
Power Adjustment Factors		(Page 2 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- ☐ ii. Dimming system; and
- ☐ f. The second stage manually activates the alternate set of lights; and
- ☐ g. This manual-ON function is not capable of conversion from manual-ON to automatic-ON functionality via manual switches or dip switches; and
- ☐ h. Switches are located in accordance with Section 130.1(a)
- ☐ i. Occupants can manually do all of the following regardless of the sensor status:
 - ☐ Activate the alternate set of lights; and
 - ☐ Activate 100 percent of the lighting power; and
 - ☐ Deactivate all of the lights.
- ☐ 2. This installation qualifies for the PAF for an occupant sensing control controlling the general lighting in large open plan office areas above workstations, in accordance with TABLE 140.6-A, because the following requirements have been met:
 - ☐ a. The occupant sensing controls are in large open plan offices that are greater than 250 square feet and:
 - ☐ i. One sensor is controlling an area that is no larger than 125 square feet, and the PAF used in 0.40
 - ☐ ii. One sensor is controlling an area that is from 126 to 250 square feet, and the PAF used in 0.30
 - ☐ iii. One sensor is controlling an area that is from 251 to 500 square feet, and the PAF used in 0.20
 - ☐ b. This PAF is only being applied only to office areas which contain workstations; and
 - ☐ c. Controlled luminaires are only those which provide general lighting directly above the controlled area, or furniture mounted luminaires that comply with Section 140.6(a)2 and provide general lighting directly above the controlled area; and
 - ☐ d. Qualifying luminaires have been controlled by occupant sensing controls that meet all of the following requirements, as applicable:
 - ☐ i. Infra-red sensors have been equipped by the manufacturer, or fitted in the field by the installer, with lenses or shrouds to prevent them from being triggered by movement outside of the controlled area.
 - ☐ ii. Ultrasonic sensors have been tuned to reduce their sensitivity to prevent them from being triggered by movements outside of the controlled area.
 - ☐ iii. All other sensors have been installed and adjusted as necessary to prevent them from being triggered by movements outside of the controlled area.
- ☐ 3. This installation qualifies for the PAF for a Manual Dimming System or a Multiscene Programmable Dimming System in TABLE 140.6-A because:
 - ☐ a. The lighting is controlled with a control that can be manually operated by the user; and
 - ☐ b. The space is only of the following type:
 - ☐ i. Hotel/motel
 - ☐ ii. Restaurant
 - ☐ iii. Auditorium
 - ☐ iv. Theater
 - ☐ c. The type of control and PAF used is one of the following:
 - ☐ i. A Dimming System with manual dimming and the PAF used is 0.10

POWER ADJUSTMENT FACTORS

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CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-05-H
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Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- ☐ ii. A Multiscene Programmable control and the PAF used is 0.20
- ☐ 4. This installation qualifies for the PAF for a Demand Responsive Control in TABLE 140.6-A, because the installation meets all of the following requirements:
- ☐ i. The building is 10,000 square feet or smaller; and
 - ☐ ii. The PAF used is 0.05. Note that luminaires that qualify for other PAFs may also qualify for this demand responsive control PAF.
 - ☐ iii. The controlled lighting is capable of being automatically reduced in response to a demand response signal; and
 - ☐ iv. Lighting has been reduced in a manner consistent with uniform level of illumination requirements in TABLE 130.1-A; and
 - ☐ v. Spaces that are non-habitable have not been used to comply with this requirement, and
 - ☐ v. Spaces with a lighting power density of less than 0.5 watts per square foot have not been counted toward the building's total lighting power.
- ☐ 5. This installation qualifies for the PAF for Combined Manual Dimming plus Partial-ON Occupant Sensing Control in TABLE 140.6-A because the installation meets all of the following requirements:
- ☐ a. The Combined Control is use in only the following space types:
 - ☐ i, An area ≤ 250 square feet enclosed by floor-to-ceiling partitions
 - ☐ ii. A classroom of any size
 - ☐ iii. A conference room of any size
 - ☐ iv. A waiting room of any size
 - ☐ b. The lighting is controlled with a control that can be manually operated by the user; and
 - ☐ c. The dimming component is one of the following:
 - ☐ i. A Dimming System with manual dimming; or
 - ☐ ii. A Multiscene Programmable control
 - ☐ d. The Partial-ON Occupant Sensing component automatically deactivates all of the lighting power in the area within 30 minutes after the room has been vacated; and
 - ☐ i. The first stage automatically activates between 30-70 percent of the lighting power in the area
 - ☐ ii. The lighting control is a:
 - ☐ Switching system, or
 - ☐ Dimming system; and
 - ☐ iii. The second stage manually activates the alternate set of lights; and
 - ☐ iv. This manual-ON function is not capable of conversion from manual-ON to automatic-ON functionality via manual switches or dip switches; and
 - ☐ v. Switches are located in accordance with Section 130.1(a)
 - ☐ vi. Occupants can manually do all of the following regardless of the sensor status:
 - ☐ Activate the alternate set of lights; and
 - ☐ Activate 100 percent of the lighting power; and
 - ☐ Deactivate all of the lights.
 - ☐ e. The PAF used is 0.25

PART 3 PAF Minimum Requirements***Check all that apply:***

POWER ADJUSTMENT FACTORS

CEC-NRCI-LTI-05-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-05-H
Power Adjustment Factors		(Page 4 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- ☐ A. The lighting control used to earn the PAF is designed and installed in addition to all manual, and automatic lighting controls otherwise required in 130.1(a) through (e)
 - ☐ EXCEPTION. The lighting control used to earn a PAF has been designed and installed for the sole purpose of compliance with Section 130.1(b)3, and this lighting control is designed and installed in addition to all other manual, and automatic lighting controls otherwise required in Section 130.1.
- ☐ B. Installed wattage has been determined in accordance with Section 130.0(c)
- ☐ C. Space types that qualify for the PAF comply with the definition for that space type in Section 100.1(b)
- ☐ D. Self contained lighting controls used to earn the PAF comply with Section 110.9 and are certified in accordance with the Appliance Efficiency Regulations, as verified on the Title 20 database of certified lighting controls
- ☐ E. A lighting control system is used to earn the PAF, which complies with Section 110.9.
 - ☐ When using a lighting control system to earn a PAF, also submit the Installation Certificate for Energy Management Control System and Lighting Control System
- ☐ F. The controls are permanently installed nonresidential-rated lighting controls. (Portable lighting, portable lighting controls, and residential rated lighting controls shall not qualify for PAFs.)
- ☐ G. The controlled lighting used to earn this PAF is a permanently installed general lighting system.
 - ☐ Furniture mounted luminaires qualify as general lighting system for the purpose of earning this PAF because the general lighting is in an office, and the furniture mounted luminaires comply with all of the following conditions:
 - i. The furniture mounted luminaires have been permanently installed no later than the time of building permit inspection; and
 - ii. The furniture mounted luminaires have been permanently hardwired; and
 - iii. The furniture mounted lighting system has been designed to provide indirect general lighting; and
 - iv. Before multiplying the installed watts of the furniture mounted luminaire by the applicable PAF, 0.3 watts per square foot of the area illuminated by the furniture mounted luminaires has been subtracted from installed watts of the furniture mounted luminaires; and
- ☐ H. At least 50 percent of the light output of the controlled luminaire is within the applicable area listed in TABLE 140.6-A. Luminaires on lighting tracks are within the applicable area in order to qualify for a PAF.
- ☐ I. Only one PAF from TABLE 140.6-A has been used for each qualifying luminaire. PAFs have not been added together unless specifically allowed in TABLE 140.6-A.
- ☐ L. Only lighting wattage directly controlled in accordance with Section 140.6(a)2 has been used to reduce the calculated actual indoor Lighting Power Densities as allowed by Section 140.6(a)2.
 - ☐ Only a portion of the wattage in a luminaire is controlled in accordance Section 140.6(a)2, and only that portion of controlled wattage has been reduced in calculating actual indoor Lighting Power Density.

POWER ADJUSTMENT FACTORS

CEC-NRCI-LTI-05-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-LTI-05-H
Power Adjustment Factors		(Page 5 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/ HERS Certification Identification (If applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.
4. I understand that a HERS rater will check the installation to verify compliance, and that if such checking identifies defects; I am required to take corrective action at my expense. I understand that Energy Commission and HERS Provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
5. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
6. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	



CERTIFICATE OF INSTALLATION		NRCI-LTI-06-E
Videoconference Studio Lighting		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION				
DATE OF BUILDING PERMIT		PERMIT #		
BUILDING TYPE	<input type="checkbox"/> Nonresidential	<input type="checkbox"/> High-Rise Res (Common Area)	<input type="checkbox"/> Hotel/Motel (Common Area)	
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration	<input type="checkbox"/> Unconditioned

SCOPE OF RESPONSIBILITY	
Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Certificate of Installation.	Date:

Additional Videoconference Studio Lighting

§130.4(b). - Before the Additional Videoconference Studio Lighting power allotment will be allowed for compliance with Section 140.6 of Part 6 of Title 24, the person who is eligible under Division 3 of the Business and Professions Code to accept responsibility for the construction or installation of features, materials, components, or manufactured devices shall sign and submit this Certificate of Installation.

§140.6(c)2G(vii) - In addition to all other additional lighting power allowed under Sections 140.6(c)2Gi through vi, up to 1.5 watts per square foot of additional lighting power shall be allowed in a videoconferencing studio, as defined in Section 100.1, provided the following conditions are met:

- a. A completed and signed Certificate of Installation is prepared and submitted in accordance with Section 130.4(b), specifically detailing compliance with the applicable requirements of Section 140.6(c)2Gvii; and
- b. The Videoconferencing Studio is a room with permanently installed videoconferencing cameras, audio equipment, and playback equipment for both audio-based and video-based two-way communication between local and remote sites; and
- c. General lighting is switched in accordance with TABLE 130.1-A; and
- d. Wall wash lighting is separately switched from the general lighting system; and
- e. All of the lighting in the studio, including general lighting and additional lighting power allowed by Section 140.6(c)2Gvii is controlled by a multiscene programmable control system (also known as a scene preset control system).

If any of the requirements in this Certificate of Installation fail, the installation shall not be eligible for the additional lighting power allotment.

Check the following:

- ☐ A. The videoconferencing studio is using only the Area Category Method for compliance. The extra lighting allowance has not been taken for a space using the Complete Building Method or Tailored Method of compliance.
- ☐ B. The Videoconferencing Studio is a room with permanently installed videoconferencing cameras, audio equipment, and playback equipment for both audio-based and video-based two-way communication between local and remote sites.
- ☐ C. General lighting is switched in accordance with Table 130.1-A



CERTIFICATE OF INSTALLATION		NRCI-LTI-06-E
Videoconference Studio Lighting		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- ☐ D. Wall wash lighting is separately switched from the general lighting system.
- ☐ E. All of the lighting is controlled by a multiscene programmable control system (scene preset control system)

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:



CERTIFICATE OF INSTALLATION		NRCI-LTO-01-E
Outdoor Lighting		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION			
DATE OF BUILDING PERMIT	PERMIT #		
BUILDING TYPE	<input type="checkbox"/> Nonresidential Outdoor Lighting		
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration
<i>If more than one person has responsibility for building construction, each person shall prepare and sign an Installation Certificate document applicable to the portion of construction for which they are responsible; alternatively, the person with chief responsibility for construction shall prepare and sign the Installation Certificate document(s) for the entire construction.</i>			

SCOPE OF RESPONSIBILITY	
<i>Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate.</i>	Date:

In the table below, identify all construction documents that show that the outdoor lighting and controls were installed as it was proposed in the Certificates of Compliance.		
Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency



CERTIFICATE OF INSTALLATION		NRCI-LTO-01-E
Outdoor Lighting		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:



CERTIFICATE OF INSTALLATION		NRCI-LTO-02-E
Energy Management Control System or Lighting Control System		(Page 1 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION			
DATE OF BUILDING PERMIT		PERMIT #	
BUILDING TYPE	<input type="checkbox"/> Nonresidential Outdoor Lighting		
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration

SCOPE OF RESPONSIBILITY	
Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate.	Date:

Requirements in the Standards:

§130.4(b) Before an Energy Management Control System (EMCS), or Lighting Control System can be recognized for compliance with the lighting control requirements in Part 6 of Title 24, the person who is eligible under Division 3 of the Business and Professions Code to accept responsibility for the construction or installation of features, materials, components, or manufactured devices shall sign and submit this Installation Certificate.

If any of the requirements in this Installation Certificate fail the Energy Management Control System or Lighting Control System installation requirements, these options for controlling lighting shall not be recognized for compliance with the Building Energy Efficiency Standards.

Check all that apply:**PART 1 What type of Lighting Control System has been installed?**

- ☐ **A. Energy Management Control System (EMCS)** - Is a computerized control system designed to regulate the energy consumption of a building by controlling the operation of energy consuming systems, such as the heating, ventilation and air conditioning (HVAC), lighting, and water heating systems, and is capable of monitoring environmental and system loads, and adjusting HVAC operations in order to optimize energy usage and respond to demand response signals.
- ☐ The Energy Management Control System has been installed to function as a lighting control required by Part 6 and functionally meets all applicable requirements for each application for which it is installed, in accordance with Sections 110.9, 130.0 through 130.5, 140.6 through 150.0, and 150.2; and complies with Reference Nonresidential Appendix NA7.7.2.
- ☐ The EMCS has been separately tested for each respective lighting control system for which it is installed to function as.
- ☐ **B. Lighting Control System** - Requires two or more components to be installed in the building to provide all of the functionality required to make up a fully functional and compliant lighting control.
- ☐ The installed Lighting Control System complies with the requirements checked below; and all components of the system considered together as installed meet all applicable requirements for the application for which they



CERTIFICATE OF INSTALLATION		NRCI-LTO-02-E
Energy Management Control System or Lighting Control System		(Page 2 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

are installed as required in Sections 130.0 through 130.5, Sections 140.6 through 140.8, Section 141.0, and Section 150.0(k).

PART 2 Lighting Control Functional requirements:

Check all that apply when verifying the installation of an EMCS or Lighting Control System.

- ☐ A. All outdoor lighting controls and equipment have been installed in accordance with the manufacturer's instructions.
- ☐ B. The manufacturer has provided instructions for calibration.
- ☐ C. If indicator lights are integral to any components, such indicator lights consumes no more than 1 watt of power per indicator light.
- ☐ D. Components that are regulated by the Title 20 Appliance Efficiency Regulations have been certified to the Energy Commission.
- ☐ E. The EMCS or Lighting Control System functions as one or more of the Time-Switch Lighting Controls checked below, and complies with all of the following requirements:
 - ☐ 1. Automatic Time-Switch Controls meeting all requirements for Automatic Time Switch Control devices in the Title 20 Appliance Efficiency Regulations, including the requirements below:
 - a. Commercial automatic time-switch controls meet the following requirements:
 - i. Has program backup capabilities that prevent the loss of the device's schedule for at least 7 days, and the device's date and time for at least 72 hours if power is interrupted;
 - ii. Is capable of providing manual override to each connected load and shall resume normally scheduled operation after manual override is initiated within 2 hours for each connected load; and
 - iii. Incorporates an automatic holiday shutoff feature that turns off all connected loads for at least 24 hours and then resumes normally scheduled operation.
 - ☐ 2. Astronomical Time-Switch Controls meeting all requirements for Astronomical Time-Switch Control devices in the Title 20 Appliance Efficiency Regulations, including the requirements below:
 - a. Meets the requirements of an automatic time-switch control;
 - b. Has sunrise and sunset prediction accuracy within plus-or-minus 15 minutes and timekeeping accuracy within 5 minutes per year;
 - c. Is capable of displaying date, current time, sunrise time, sunset time, and switching times for each step during programming;
 - d. Has an automatic daylight savings time adjustment; and
 - e. Has the ability to independently offset the on and off for each channel by at least 99 minutes before and after sunrise or sunset.
 - ☐ 3. Multi-Level Astronomical Time-Switch Controls, in addition to meeting all of the requirements for Astronomical Time-Switch Controls, includes at least 2 separately programmable steps per zone.
- ☐ F. The EMCS or Lighting Control System functions as one or more of the Daylighting Controls listed below:
 - ☐ 1. Automatic Daylight Controls meet all requirements for Automatic Daylight Control devices in the Title 20 Appliance Efficiency Regulations, including the following:



CERTIFICATE OF INSTALLATION		NRCI-LTO-02-E
Energy Management Control System or Lighting Control System		(Page 3 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- a. Is capable of reducing the power consumption in response to measured daylight either directly or by sending and receiving signals;
 - b. If the system includes a dimmer, complies with the Dimmer Control device requirements in the Title 20 Appliance Efficiency Regulations.
 - c. Automatically return to its most recent time delay settings within 60 minutes when put in calibration mode;
 - d. Has a set point control that easily distinguishes settings to within 10 percent of full scale adjustment;
 - e. Has a light sensor that has a linear response within 5 percent accuracy over the range of illuminance measured by the light sensor;
 - f. Has a light sensor that is physically separated from where the calibration adjustments are made, or is capable of being calibrated in a manner that the person initiating the calibration is remote from the sensor during calibration to avoid influencing calibration accuracy; and
 - g. Complies with the Title 20 requirements for photo controls if the system contains a photo control component.
- ☐ 2. Photo Controls meet all requirements for Photo Control devices in the Title 20 Appliance Efficiency Regulations, including the following that it does not have a mechanical device that permits disabling of the control.
- ☐ G. The EMCS or Lighting Control System functions as a Dimmer and meets all requirements for a Dimmer Control device in the Title 20 Appliance Efficiency Regulations, including the following:
1. Is capable of reducing power consumption by a minimum of 65 percent when the dimmer is at its lowest level;
 2. Includes an off position which produces a zero lumen output; and
 3. Does not consume more than 1 watt per lighting dimmer switch leg when in the off position.
 4. Dimmer controls that can directly control lamps provide electrical outputs to lamps for reduced flicker operation through the dimming range so that the light output has an amplitude modulation of less than 30 percent for frequencies less than 200 Hz without causing premature lamp failure.
 5. If designed for use in three way circuits is capable of turning lights off, and to the level set by the dimmer if the lights are off.
- ☐ H. The EMCS or Lighting Control System meets the following requirements:
1. Is capable of automatically turning off controlled lights in the area no more than 30 minutes after the area has been vacated;
 2. Allows all lights to be manually turned off regardless of the status of occupancy; and
 3. Has a visible status signal that indicates that the device is operating properly, or that it has failed or malfunctioned. The visible status signal may have an override switch that turns off the signal.
 4. All occupant sensing devices that utilize ultrasonic radiation for detection of occupants meet the Ultrasound Maximum Decibel Values in the Title 20 Appliance Efficiency Regulations
 5. All occupant sensing devices that utilize microwave radiation for detection of occupants meet the radiation requirements in the Title 20 Appliance Efficiency Regulations
 6. Occupant sensing devices incorporating dimming comply with the requirements for dimmer controls in the Title 20 Appliance Efficiency Regulations
 7. The EMCS or Lighting Control System functions as one or more of the Occupant Sensing Controls
- Checked Below:



CERTIFICATE OF INSTALLATION		NRCI-LTO-02-E
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Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

- ☐ b. Motion Sensors meeting all applicable requirements for Motion Sensor Controls devices in the Title 20 Appliance Efficiency Regulations, including that motion sensors are rated for outdoor use.
- ☐ d. Partial-ON Sensors meeting all applicable requirements for partial on sensing devices in the Title 20 Appliance Efficiency Regulations, including the following:
 - i. Has two poles each with automatic-off functionality;
 - ii. Has one pole that is manual-on and does not incorporate DIP switches, or other manual means, for conversion between manual and automatic functionality; and
 - iii. Has one pole that is automatic-on and is not be capable of conversion by the user to manual-on functionality.
- ☐ e. Partial-OFF Sensors meet all applicable requirements for partial off sensing devices in the Title 20 Appliance Efficiency Regulations, including the following:
 - i. Has two poles;
 - ii. Has one pole that is manual-on and manual off; and
 - iii. Has one pole that is automatic-on and automatic-off and is not capable of conversion by the user to manual-on only functionality.

PART 3 Requirements for which the control is being installed to complied with:

Identify all requirements in the Standards for which the EMCS or Lighting Control System is installed to function as and complies with:

Check all that are applicable

- ☐ A. Section 130.2(c)1 Photocontrol
- ☐ B. Section 130.2(c)1 Outdoor astronomical time-switch control
- ☐ C. Section 130.2 (c)3 Motion Sensor
- ☐ D. Section 130.2 (c)4A Part-Night Outdoor Lighting Control
- ☐ E. Section 130.2 (c)4B Motion Sensor
- ☐ F. Section 130.2 (c)5A Part-Night Outdoor Lighting Control
- ☐ G. Section 130.2 (c)5B Motion Sensor
- ☐ H. Section 130.2 (c)5C Centralized time-based zone lighting control.



CERTIFICATE OF INSTALLATION		NRCI-LTO-02-E
Energy Management Control System or Lighting Control System		(Page 5 of 5)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (if applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:



CERTIFICATE OF INSTALLATION

NRCI-LTS-01-E

Sign Lighting

(Page 1 of 2)

Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION

DATE OF BUILDING PERMIT	PERMIT #	
Location of Sign(s)	<input type="checkbox"/> Outdoor Sign(s)	<input type="checkbox"/> Indoor Sign(s)
TYPE OF CONSTRUCTION	<input type="checkbox"/> New Sign(s)	<input type="checkbox"/> Sign Alteration

SCOPE OF RESPONSIBILITY

<p><i>Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate.</i></p>	<p>Date:</p>
--	--------------

In the table below identify all applicable construction documents that specify the requirements for the scope of responsibility reported by this Installation Certificate (continued).

[illegible]



CERTIFICATE OF INSTALLATION		NRCI-LTS-01-E
Sign Lighting		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none">The information provided on this Certificate of Installation is true and correct.I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:



CERTIFICATE OF INSTALLATION		NRCI-MCH-01-E
Mechanical		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. GENERAL INFORMATION

DATE OF BUILDING PERMIT	
BUILDING TYPE	
PHASE OF CONSTRUCTION	

If more than one person has responsibility for building construction, each person shall prepare and sign an Installation Certificate document applicable to the portion of construction for which they are responsible; alternatively, the person with chief responsibility for construction shall prepare and sign the Installation Certificate document(s) for the entire construction.

B. SCOPE OF RESPONSIBILITY

Date of approval by the enforcement agency of the Certificate of Compliance that provides the specifications for this Installation Certificate.

In the table below identify all applicable construction documents that specify the features, materials, components, manufactured devices, or system performance diagnostic results required for the scope of responsibility for this Installation Certificate.

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency



CERTIFICATE OF INSTALLATION		NRCI-MCH-01-E
Mechanical		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

WATER HEATING SYSTEM GENERAL INFORMATION

CEC-NRCI-PLB-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-01-E
Water Heating System General Information		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. GENERAL INFORMATION/SYSTEM INFORMATION		
01	Water Heater System Name:	
02	Water Heater System Configuration:	
03	Water Heater System Type:	
04	Building Type:	
05	Total Number of Water Heaters in Systems:	
06	Central DHW Distribution Type:	
07	Dwelling Unit DHW Distribution Type:	
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.		

B. WATER HEATER INFORMATION		
<i>Each water heater type requires a separate form.</i>		
01	Water Heater Type:	
02	Fuel Type	
03	Manufacturer:	
04	Model Number:	
05	Number of Identical Water Heaters:	
06	Efficiency:	
07	Required Minimum Efficiency:	
08	Standby Total or Standby:	
09	Rated Input	
10	Pilot Energy:	
11	Water Heater Tank Storage Volume:	
12	Exterior Insulation On Water Heater:	
13	Volume of Supplemental Storage:	
14	Internal Insulation on Supplemental Storage:	
15	Exterior Insulation on Supplemental Storage:	
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.		

WATER HEATING SYSTEM GENERAL INFORMATION

CEC-NRCI-PLB-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-01-E
Water Heating System General Information		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

HIGH RISE RESIDENTIAL, HOTEL/MOTEL SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-02-E
High Rise Residential, Hotel/Motel Single Dwelling Unit Hot Water System Distribution		(Page 1 of 4)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. DHW DISTRIBUTION SYSTEM

01	Water Heating System Name:	
02	Distribution type:	

B. MANDATORY MEASURES FOR ALL DOMESTIC HOT WATER DISTRIBUTION SYSTEMS

01	Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations (Section 110.3(b)1).
02	Unfired Storage Tanks are insulated with an external R-12 or combination of R-16 internal and external Insulation. (Section 110.3(c)4).
03	The first 5 feet of hot and cold water pipes shall be insulated from the storage tank with R3.6 or 1" of insulation.
04	All hot water piping insulated from the water heater to the kitchen fixture or appliance with R3.6 or 1" of insulation
05	All piping with a nominal diameter of 3/4 inch (19 millimeter) or larger must be insulated with R3.6 or 1" of insulation. (Section 150.0(j))
06	All piping associated with a domestic hot water recirculation system regardless of the pipe diameter must be insulated (Section 150.0(j))
07	Piping from the heating source to storage tank or between tanks must be insulated (Section 150.0(j))
08	Piping buried below grade must be installed in a water proof and non-crushable casing or sleeve that allows for installation, removal, and replacement of the enclosed pipe and insulation. (Section 150.0(j))
09	All elbows and tees shall be fully insulated. (RA4.4.1)
10	Where insulation is required, no piping shall be visible due to insulation voids. (RA4.4.1)
11	All insulation shall fit tightly to the pipe. (RA4.4.1)
12	The maximum length per dwelling unit of 1 inch diameter piping in a non-recirculating system is less than 15 feet
13	For Gas or Propane Water Heaters: Ensure the following are installed (Section 150.0(n)) <ol style="list-style-type: none"> 1. A 120V electrical receptacle is within 3 feet from the water heater and accessible with no obstructions 2. A Category III or IV vent, or a Type B vent with straight pipe between outside and water heater 3. A condensate drain no more than 2 inches higher than the base on water heater for natural draining 4. A gas supply line with capacity of at least 200,000 Btu/Hr
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

C. (STD)-Standard Distribution System (trunk and branch systems only) << Table C appears only if (STD)- is selected in A2.>>

01	Verification of measures B1 through B11 show compliance for standard distribution system
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

HIGH RISE RESIDENTIAL, HOTEL/MOTEL SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-02-E
High Rise Residential, Hotel/Motel Single Dwelling Unit Hot Water System Distribution		(Page 2 of 4)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

D. (PIC)- Pipe Insulation Credit (For trunk and branch Hot Water system) << Table D appears only if (PIC)- is selected in A2.>>

- | | |
|----|--|
| 01 | All hot water piping 1" and smaller shall be insulated to R-3.6 and be 1 inch thick. Piping with a diameter larger than 1 inch shall comply with the insulation requirements in Table 120.3-A. |
|----|--|

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

E. (R-ND)- Recirculation non demand controls << Table G appears only if (R-ND)- is selected in A2.>>

- | | |
|----|---|
| 01 | If more than one loop installed each loop shall have its own pump and controls |
| 02 | Automatic Air release valve is installed on the inlet side of the recirculation pump per Section 110.3(c)5A. |
| 03 | A check valve is located between the recirculation pump and the water heater per Section 110.3(c)5B. |
| 04 | Hose bibb is installed between the pump and the water heating equipment with an isolation valve between the hose bibb and the water heating equipment per Section 110.3(c)5C. |
| 05 | Isolation valves are installed on both sides of the pump. One of the isolation valves may be the same isolation valve as in item 4 above per Section 110.3(c)5D. |
| 06 | The cold water supply piping and the recirculation loop piping is not connected to the hot water storage tank drain port per Section 110.3(c)5E. |
| 07 | A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply per Section 110.3(c)5F. |

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

F.(RDRmc)-Demand Recirculation – Manual Control << Table H appears only if (RDRmc)- is selected in A2>>

- | | |
|----|--|
| 01 | Verify the controlled recirculation systems operate "on-demand", meaning that pump operation shall be initiated shortly prior to the hot water draw. The controls shall operate on the principal of shutting off the pump with a sensed rise in pipe temperature (Delta-T) |
| 02 | If more than one loop installed each loop shall have its own pump and controls |
| 03 | Verify that the pump, demand controls and thermo-sensor are present |
| 04 | Manual switches are located in the kitchen, all bathrooms, and any hot water use location that is at least 20 feet (measured along the hot water piping) from the water heater |
| 05 | Manual controlled systems may be activated by wired or wireless button mechanisms |
| 06 | Automatic Air release valve is installed on the inlet side of the recirculation pump per Section 110.3(c)5A. |
| 07 | A check valve is located between the recirculation pump and the water heater per Section 110.3(c)5B. |
| 08 | Hose bibb is installed between the pump and the water heating equipment with an isolation valve between the hose bibb and the water heating equipment per Section 110.3(c)5C. |
| 09 | Isolation valves are installed on both sides of the pump. One of the isolation valves may be the same isolation valve as in item 8 above per Section 110.3(c)5D. |
| 10 | The cold water supply piping and the recirculation loop piping is not connected to the hot water storage tank drain port per Section 110.3(c)5E. |
| 11 | A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply per Section 110.3(c)5F. |

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

HIGH RISE RESIDENTIAL, HOTEL/MOTEL SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-02-E
High Rise Residential, Hotel/Motel Single Dwelling Unit Hot Water System Distribution		(Page 3 of 4)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

G. (RDRsc)-Demand Recirculation – Sensor Control << Table I appears only if (RDRsc)- is selected in A2.>>

01	Verify the controlled recirculation systems operate “on-demand”, meaning that pump operation shall be initiated shortly prior to the hot water draw. The controls shall operate on the principal of shutting off the pump with a sensed rise in pipe temperature (Delta-T)
02	If more than one loop installed each loop shall have its own pump and controls
03	Verify that the pump, demand controls and thermo-sensor are present
04	Sensor controls are located in the kitchen, all bathrooms, and any hot water use location that is at least 20 feet (measured along the hot water piping) from the water heater
05	Automatic Air release valve is installed on the inlet side of the recirculation pump per Section 110.3(c)5A.
06	A check valve is located between the recirculation pump and the water heater per Section 110.3(c)5B.
07	Hose bibb is installed between the pump and the water heating equipment with an isolation valve between the hose bibb and the water heating equipment per Section 110.3(c)5C.
08	Isolation valves are installed on both sides of the pump. One of the isolation valves may be the same isolation valve as in item 7 above per Section 110.3(c)5D.
09	The cold water supply piping and the recirculation loop piping is not connected to the hot water storage tank drain port per Section 110.3(c)5E.
10	A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply per Section 110.3(c)5F.

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

H. Other << Table H appears only if H is selected in A2>>

01	Verification of measures B1 through B11
----	---

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

HIGH RISE RESIDENTIAL, HOTEL/MOTEL SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-02-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-02-E
High Rise Residential, Hotel/Motel Single Dwelling Unit Hot Water System Distribution		(Page 4 of 4)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
1. The information provided on this Certificate of Installation is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. 3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. 4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. 5. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

HIGH RISE RESIDENTIAL/HOTEL/MOTEL CENTRAL HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-03-E
High Rise Residential/Hotel/Motel Central Hot Water System Distribution		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. DHW DISTRIBUTION SYSTEM

01	Water Heating System Name:	
02	Distribution type:	

B. MANDATORY MEASURES FOR ALL CENTRAL HOT WATER SYSTEMS

01	Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations (Section 110.3(b)1).
02	Outlet temperature controls: On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed in the ASHRAE Handbook shall have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature. (Section 110.3 (c)1)
03	Controls for hot water distribution systems: Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (Section 110.3(c)2).
04	Controls shall limit outlet temperature in public lavatories to 110°F. (Section 110.3(c)3).
05	Unfired Storage Tanks are insulated with an external R-12 or combination of R-16 internal and external Insulation. (Section 110.3(c)4).
06	All hot water pipes are insulated per the insulation requirements of Table 120.3A(Section 120.3)(1" insulation for 1" and smaller pipes. 1.5" insulation for 1 to 1.5 inch pipes)
07	Recirculation systems: Automatic Air release valve is installed on the inlet side of the recirculation pump per Section 110.3(c)5A.
08	Recirculation systems: A check valve is located between the recirculation pump and the water heater per Section 110.3(c)5B.
09	Recirculation systems: Hose bibb is installed between the pump and the water heating equipment with an isolation valve between the hose bibb and the water heating equipment per Section 110.3(c)5C.
10	Recirculation systems: Isolation valves are installed on both sides of the pump. One of the isolation valves may be the same isolation valve as in item 9 above per Section 110.3(c)5D.
11	Recirculation systems: The cold water supply piping and the recirculation loop piping is not connected to the hot water storage tank drain port per Section 110.3(c)5E.
12	Recirculation systems: A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply per Section 110.3(c)5F.

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

C. Multiple Dwelling Units – Recirculation Temperature Modulation Control << Table C appears only if C is selected in A2>>

01	Controls have been installed that have the capability of modulating water temperature. These controls must the capability of using historical use patterns to adjust water temperature.
02	Daily hot water supply temperature reduction (sum of temperature reduction by the control in each hour within a 24-hour period) shall be more than 50 degrees Fahrenheit

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

HIGH RISE RESIDENTIAL/HOTEL/MOTEL CENTRAL HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-03-E
High Rise Residential/Hotel/Motel Central Hot Water System Distribution		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

D. Multiple Dwelling Units – Recirculation Continuous Monitoring Systems << Table C appears only if D is selected in A2>>

- | | |
|----|---|
| 01 | The water heating system must have remote sensor controls with telepathy capabilities installed. |
| 02 | Monitoring system must record no less frequently than hourly measurement of key system operation parameters, including hot water supply and return temperatures, and status of gas valve relays |
| 03 | Current contract must be available that demonstrate the system will be monitored. |

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

E. Multiple Dwelling Units – Demand Recirculation << Table E appears only if E is selected in A2>>

- | | |
|----|--|
| 01 | Verify the controlled recirculation systems operate "on-demand", meaning that pump operation shall be initiated shortly prior to the hot water draw. The controls shall operate on the principal of shutting off the pump with a sensed rise in pipe temperature (Delta-T) |
| 02 | If more than one loop installed each loop shall have its own pump and controls |
| 03 | Verify that the pump, demand controls and thermo-sensor are present |
| 04 | Systems may be activated by wired or wireless button mechanisms |

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

F. Other << Table F appears only if F is selected in A2>>

- | | |
|----|--|
| 01 | Verification of measures B01 through B12 |
|----|--|

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

HIGH RISE RESIDENTIAL/HOTEL/MOTEL CENTRAL HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-03-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-03-E
High Rise Residential/Hotel/Motel Central Hot Water System Distribution		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/ HERS Certification Identification (If applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Installation is true and correct.
- I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.
- I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
- I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

NONRESIDENTIAL SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION		NRCI-PLB-04-E
Nonresidential Single Dwelling Unit Hot Water System Distribution		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. HW DISTRIBUTION SYSTEM

01	Water Heating System Name:	
----	----------------------------	--

B. MANDATORY MEASURES FOR ALL HOT WATER DISTRIBUTION SYSTEMS

01	Service water-heating systems equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use (Section 110.3(b)1).
02	Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations (Section 110.3(b)1).
03	Outlet temperature controls: On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed in the ASHRAE Handbook shall have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature. (Section 110.3 (c)1)
04	Controls for hot water distribution systems: Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (Section 110.3(c)2).
05	Controls shall limit outlet temperature in public lavatories to 110°F. (Section 110.3(c)3).
06	Unfired Storage Tanks are insulated with an external R-12 or combination of R-16 internal and external Insulation. (Section 110.3(c)4).
07	Recirculation systems: Automatic Air release valve is installed on the inlet side of the recirculation pump per Section 110.3(c)5A.
08	Recirculation systems: A check valve is located between the recirculation pump and the water heater per Section 110.3(c)5B.
09	Recirculation systems: Hose bibb is installed between the pump and the water heating equipment with an isolation valve between the hose bibb and the water heating equipment per Section 110.3(c)5C.
10	Recirculation systems: Isolation valves are installed on both sides of the pump. One of the isolation valves may be the same isolation valve as in item 9 above per Section 110.3(c)5D.
11	Recirculation systems: The cold water supply piping and the recirculation loop piping is not connected to the hot water storage tank drain port per Section 110.3(c)5E.
12	Recirculation systems: A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply per Section 110.3(c)5F.

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

NONRESIDENTIAL SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-04-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION		NRCI-PLB-04-E
Nonresidential Single Dwelling Unit Hot Water System Distribution		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

NONRESIDENTIAL CENTRAL HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-05-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-05-E
Nonresidential Central Hot Water System Distribution		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. HW DISTRIBUTION SYSTEM

01	Water Heating System Name:	
----	----------------------------	--

B. MANDATORY MEASURES FOR ALL HOT WATER DISTRIBUTION SYSTEMS

01	Service water-heating systems equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use (Section 110.3(b)1).
02	Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations (Section 110.3(b)1).
03	Outlet temperature controls: On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed in the ASHRAE Handbook shall have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature. (Section 110.3 (c)1)
04	Controls for hot water distribution systems: Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (Section 110.3(c)2).
05	Controls shall limit outlet temperature in public lavatories to 110°F. (Section 110.3(c)3).
06	Unfired Storage Tanks are insulated with an external R-12 or combination of R-16 internal and external Insulation. (Section 110.3(c)4).
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12	Recirculation systems: A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply per Section 110.3(c)5F.

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

NONRESIDENTIAL CENTRAL HOT WATER SYSTEM DISTRIBUTION

CEC-NRCI-PLB-05-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-PLB-05-E
Nonresidential Central Hot Water System Distribution		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/ HERS Certification Identification (If applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:



CERTIFICATE OF INSTALLATION		NRCI-PRC-01-E
Refrigerated Warehouse		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

GENERAL INFORMATION			
DATE OF BUILDING PERMIT		PERMIT #	
BUILDING TYPE	<input type="checkbox"/> Refrigerated Warehouse		
PHASE OF CONSTRUCTION	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration
<i>If more than one person has responsibility for building construction, each person shall prepare and sign an Installation Certificate document applicable to the portion of construction for which they are responsible; alternatively, the person with chief responsibility for construction shall prepare and sign the Installation Certificate document(s) for the entire construction.</i>			

SCOPE OF RESPONSIBILITY	
Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate:	Date:

In the table below identify all applicable construction documents that specify the requirements for the scope of responsibility for this Installation Certificate.		
Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By the Enforcement Agency
Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved By



CERTIFICATE OF INSTALLATION		NRCI-PRC-01-E
Refrigerated Warehouse		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

		the Enforcement Agency

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
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Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

SOLAR PHOTOVOLTAIC SYSTEM

CEC-NRCI-SPV-01-E (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCI-SPV-01-E
Solar Photovoltaic System		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

The installer is required to fill out this form for all newly installed Photovoltaic Systems (PV) when the PV system is being used to claim Exception 1 to Section 110.10(b)1B of the Solar Ready requirements. Section 110.10(b)1B applies to High-rise Multifamily Buildings and Hotel/Motel Occupancies with fewer than ten stories and nonresidential buildings with three stories or fewer. An installer wishing to claim Exception 1 to Section 110.10(b)1B for a Low-rise Multifamily building must submit a CF2R—SPV-01-E.

A. General Information		
01	Total Roof Area (ft ²)	
02	Minimum Nameplate DC Power Rating (Watts) = Total Roof Area (ft ²) x (1 Watt/ft ²)	
03	Enter Module Manufacturer Name	
04	Enter Module Model Number	
05	Enter Module Nameplate DC Power Rating measure under Standard Test Conditions (watts)	
06	Enter Number of Modules used in the PV System	
07	Installed PV System Nameplate DC Power Rating (Watts) = Module Nameplate DC Power Rating (watts) x Number of Modules used in PV System	
08	If Installed PV System Nameplate DC Power Rating is greater than or equal to Minimum Nameplate DC Power Rating then the PV system complies, otherwise the PV System does not comply.	Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/>
The responsible person's signature on this document certifies that these requirements have been met.		



CERTIFICATE OF INSTALLATION		NRCI-SPV-01-E
Solar Photovoltaic System		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/ HERS Certification Identification (If applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
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Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:



CERTIFICATE OF INSTALLATION		NRCI-STH-01-E
Solar Water Heating Systems		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. SOLAR WATER HEATING SYSTEMS

01	Manufacturer Name	
02	Model Number	
03	SRCC Certification Number	
04	Solar Savings Fraction (annual average value)	
05	# of Collectors in System	
06	Collector Size (Square Footage)	
07	Total Storage Volume (gallons)	
08	Solar System Collector Orientation	
09	Solar System Collector Tilt	

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

B. SRCC OG-100 CERTIFIED COLLECTORS

The installed system shall meet the following eligibility criteria:

01	System is installed at the same orientation as modeled.
02	System is installed at the same tilt as modeled.
03	The system shall have the same collectors, pumps, controls, storage tank and backup water heater fuel type as the rated condition.
04	The collectors are located in a position that is not shaded by adjacent buildings or trees.
05	Backup Storage tanks are insulated with either an internal R-12 (labeled on tank) or external R-16

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

C. SIZING COMPLIANCE WITH MULTIFAMILY PRESCRIPTIVE REQUIREMENTS:

01	For climate zones 1 through 9 only - the solar system has an annual solar savings fraction of 0.2
02	For climate zones 10 through 16 only – the solar system has an annual solar savings fraction of 0.35

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.

D. MANDATORY MEASURES FOR SOLAR WATER HEATING SYSTEMS

01	For Multifamily, Hotel and Motels backup storage tanks for solar water-heating systems have R-12 external insulation or R-16 internal insulation where the internal insulation R-value indicated on the exterior of the tank. (§150.0(j)1B).
02	All domestic hot water piping (including solar) shall be insulated (§150(j)2A) or (§120.3).
03	Solar water-heating system and/or/collectors are certified by the Solar Rating and Certification Corporation. (§150.0(n)).

The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.



CERTIFICATE OF INSTALLATION		NRCI-STH-01-E
Solar Water Heating Systems		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/ HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-NRCV-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		NRCV-MCH-04-H
Duct Leakage Diagnostic Test		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. System Information		
01	HVAC System Identification or Name:	
02	HVAC System Location or Area Served:	
03	Verified Low Leakage Air-handling Unit Credit from NRCC-PRF-01-E?	
04	Duct System Compliance Category:	

B. Duct Leakage Diagnostic Test - MCH-04a - Completely New Duct System		
01	Condenser Nominal Cooling Capacity (ton)	
02	Heating Capacity (kBtu/h)	
03	Leakage Factor ()	
04	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
05	Calculated Target Allowable Duct Leakage Rate (cfm)	
06	Actual duct leakage rate from leakage test measurement (cfm)	
07	Compliance statement:	

C. ADDITIONAL REQUIREMENTS FOR COMPLIANCE		
The responsible persons signature on this document indicates the installation complies with the following requirements:		
01	System was tested in its normal operation condition. No temporary taping allowed.	
02	All supply and return register boots were sealed to the drywall.	
03	If cloth backed tape was used it was covered with Mastic and draw bands.	
04	All connection points between the air handler and the supply and return plenums are completely sealed.	
05	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.	

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-NRCV-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		NRCV-MCH-04-H
Duct Leakage Diagnostic Test		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Verification documentation is accurate and complete.	
Name:	Signature:
Company:	Date:
Address:	CEA / HERS Certification Identification (If applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<ul style="list-style-type: none"> I certify the following under penalty of perjury, under the laws of the State of California: <ol style="list-style-type: none"> The information provided on this Certificate of Verification is true and correct. I am the certified HERS Rater who performed the verification identified and reported on this Certificate of Verification (responsible rater). The installed features, materials, components, manufactured devices, or system performance diagnostic results that require HERS verification identified on this Certificate of Verification comply with the applicable requirements in Reference Nonresidential Appendices NA1 and NA2, and the requirements specified on the Certificate of Compliance for the building approved by the enforcement agency. The information reported on applicable sections of the Certificate(s) of Installation (NRCI), signed and submitted by the person(s) responsible for the construction or installation conforms to the requirements specified on the Certificate(s) of Compliance (NRCC) approved by the enforcement agency. I will ensure that a registered copy of this Certificate of Verification shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Verification is required to be included with the documentation the builder provides to the building owner at occupancy. 	
BUILDER OR INSTALLER INFORMATION AS SHOWN ON THE CERTIFICATE OF INSTALLATION	
Company Name (Installing Subcontractor or General Contractor or Builder/Owner):	
Responsible Builder/Installer Name:	CSLB License:
HERS PROVIDER DATA REGISTRY INFORMATION	
Sample Group Number (if applicable):	Dwelling Test Status in Sample Group (if applicable)
HERS RATER INFORMATION	
HERS Rater Company Name:	
Responsible Rater's Name:	Responsible Rater's Signature:
Responsible Rater's Certification Number w/ this HERS Provider	Date Signed:

A. System Information

1. *HVAC System Identification or Name:* Same data given on MCH-01; provides an identification name or tag name that uniquely identifies the duct system. If there is a mechanical plan for the system, the tag name may be given on the plans.
2. *HVAC System Location or Area Served:* Same data given on MCH-01; provides a brief description of the area served by the duct system (e.g. upstairs; downstairs).
3. *Verified Low Leakage Air-handling Unit (VLLAHU) Credit:* Same data given on PRF-01; Details whether or not VLLAHU is required per PRF-01.
4. *Duct System Compliance Category:* Choose from Completely New, Complete Replacement, or Alteration.
 - a. New: For new buildings with a new HVAC system or replacement of at least 75 percent of the duct system and up to 25 percent consisting of reused parts from the existing duct system (i.e. registers, grilles, boots, air handler, coil, plenums, duct material).
 - b. Alteration: For HVAC changeouts or when the air handler, condensing unit of a split system, or cooling coil or any amount of duct is added to an existing system but does not constitute a new duct system.
 - c. Alteration using Smoke Test: For alterations that are unable to pass the leakage test, a smoke test is allowed to confirm that all accessible leaks have been sealed.

B. Duct Leakage Diagnostic Test - MCH-04a - Completely New Duct System

1. *Condenser Nominal Cooling Capacity (ton):* Enter the condenser nominal cooling capacity, refer to the manufacturer documentation.
2. *Heating Capacity (kBtu/h):* Enter the system heating capacity, refer to the manufacturer documentation.
3. *Leakage Factor:* Depending on answer to A04 the leakage factor will be either .06 or .15.
4. *Air-Handling Unit Airflow (AHU Airflow) Determination Method:* User will select from the following options:
 - a. Cooling System Method: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity (See Section NA2.1.4.1 of the 2013 Nonresidential Appendices).
 - b. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/hr of rated heating output capacity (See Section NA2.1.4.1 of the 2013 Nonresidential Appendices)..
5. *Calculated Target Allowable Duct Leakage Rate (cfm):* This value will be automatically populated depending on values in B04.
6. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm):* User will input this value from actual measurements from leakage test.
7. *Compliance Statement:* If Actual Duct Leakage Rate from leakage test (B06) is less than or equal to Calculated Target Allowable Duct Leakage Rate (B05), "System passes leakage test" will automatically populate. If not, "System fails leakage test" will automatically populate.

CERTIFICATE OF VERIFICATION - DATA FIELD DEFINITIONS AND CALCULATIONS	NRCV-MCH-04-H
Duct Leakage Diagnostic Test - MCH-04a	Page 1 of 1

A. System Information		
01	HVAC System Identification or Name:	<<user input, text, maximum 50 characters>>
02	HVAC System Location or Area Served:	<<user input, text, maximum 50 characters>>
03	Verified Low Leakage Air-handling Unit Credit from NRCC-PRF-01-E?	<<calculated result: (= true or false depending on NRCC-PRF-01-E data: if true =>display message directing use of <u>VLLAHU</u> method 04c)>>
04	Duct System Compliance Category:	<<user pick one from list: <u>New</u> ; or <u>Alteration</u> ; or <u>Alteration using Smoke Test</u> ;>>
05	determine compliance method for this document; display applicable tables below; (this row not visible to user)	<<Calculated Result: if A04= <u>Alteration using Smoke Test</u> ; then display method: 20e. Altered Duct System using Smoke Test if A04= <u>Alteration</u> ; then display method: 20d. Altered Duct System elseif A04= <u>New</u> and A03= <u>VLLAHU (true)</u> ; then display method: 20c. Low Leakage Air-Handling Unit elseif A04= <u>New</u> then display method: 20a. Completely New Duct System >>

B. Duct Leakage Diagnostic Test - MCH-04a - Completely New Duct System		
01	Condenser Nominal Cooling Capacity (ton)	<<user input, text, maximum 50 characters>>
02	Heating Capacity (kBtu/h)	<<user input, text, maximum 50 characters>>
03	LeakageFactor ()	<<calculated field: if A04= <u>New</u> ; then LeakageFactor= <u>0.06</u> ; else <u>error message</u> if invalid entries for arguments>>
04	Air-Handling Unit Airflow (AHUAirflow) Determination Method	<<pick one from list: <u>CoolingSystemMethod</u> ; <u>HeatingSystemMethod</u> ;>>
05	Calculated Target Allowable Duct Leakage Rate (cfm)	<<calculated field: numeric xxx: if B04= <u>CoolingSystemMethod</u> then <u>AHUAirflow=CondenserNomCoolCapacityTon*400* LeakageFactor</u> ; elseif B04= <u>HeatingSystemMethod</u> then <u>AHUAirflow=HeatingCapacityKbtuh*21.7* LeakageFactor</u> >>
06	Actual duct leakage rate from leakage test measurement (cfm)	<<user input: numeric xxx.x>>
07	Compliance statement: <<if B06 is < or = to B05: "system passes leakage test"; else if B06 is > B05: "system fails leakage test">>	

C. ADDITIONAL REQUIREMENTS FOR COMPLIANCE	
The responsible persons signature on this document indicates the installation complies with the following requirements:	
01	System was tested in its normal operation condition. No temporary taping allowed.
02	All supply and return register boots were sealed to the drywall.
03	If cloth backed tape was used it was covered with Mastic and draw bands.
04	All connection points between the air handler and the supply and return plenums are completely sealed.
05	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-NRCV-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		NRCV-MCH-04-H
Duct Leakage Diagnostic Test		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. System Information

01	HVAC System Identification or Name:	
02	HVAC System Location or Area Served:	
03	Verified Low Leakage Air-handling Unit Credit from NRCC-PRF-01-E?	
04	Duct System Compliance Category:	

B. Duct Leakage Diagnostic Test - MCH-04c – Low Leakage Air Handling Unit

01	Condenser Nominal Cooling Capacity (ton)	
02	Heating Capacity (kBtu/h)	
03	Leakage Factor ()	
04	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
05	Calculated Target Allowable Duct Leakage Rate (cfm)	
06	Actual duct leakage rate from leakage test measurement (cfm)	
07	Air-Handling Unit Manufacturer Name	
08	Air-Handling Unit Model Number	
09	Compliance statement:	

C. ADDITIONAL REQUIREMENTS FOR COMPLIANCE**The responsible persons signature on this document indicates the installation complies with the following requirements:**

01	System was tested in its normal operation condition. No temporary taping allowed.
02	All supply and return register boots were sealed to the drywall.
03	If cloth backed tape was used it was covered with Mastic and draw bands.
04	All connection points between the air handler and the supply and return plenums are completely sealed.
05	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.

Registration Number:

Registration Date/Time:

HERS Provider:

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance

June 2013

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-NRCV-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		NRCV-MCH-04-H
Duct Leakage Diagnostic Test		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Verification documentation is accurate and complete.	
Name:	Signature:
Company:	Date:
Address:	CEA / HERS Certification Identification (If applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<ul style="list-style-type: none"> I certify the following under penalty of perjury, under the laws of the State of California: <ol style="list-style-type: none"> The information provided on this Certificate of Verification is true and correct. I am the certified HERS Rater who performed the verification identified and reported on this Certificate of Verification (responsible rater). The installed features, materials, components, manufactured devices, or system performance diagnostic results that require HERS verification identified on this Certificate of Verification comply with the applicable requirements in Reference Nonresidential Appendices NA1 and NA2, and the requirements specified on the Certificate of Compliance for the building approved by the enforcement agency. The information reported on applicable sections of the Certificate(s) of Installation (NRCI), signed and submitted by the person(s) responsible for the construction or installation conforms to the requirements specified on the Certificate(s) of Compliance (NRCC) approved by the enforcement agency. I will ensure that a registered copy of this Certificate of Verification shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Verification is required to be included with the documentation the builder provides to the building owner at occupancy. 	
BUILDER OR INSTALLER INFORMATION AS SHOWN ON THE CERTIFICATE OF INSTALLATION	
Company Name (Installing Subcontractor or General Contractor or Builder/Owner):	
Responsible Builder/Installer Name:	CSLB License:
HERS PROVIDER DATA REGISTRY INFORMATION	
Sample Group Number (if applicable):	Dwelling Test Status in Sample Group (if applicable)
HERS RATER INFORMATION	
HERS Rater Company Name:	
Responsible Rater's Name:	Responsible Rater's Signature:
Responsible Rater's Certification Number w/ this HERS Provider	Date Signed:

A. System Information

1. *HVAC System Identification or Name:* Same data given on MCH-01; provides an identification name or tag name that uniquely identifies the duct system. If there is a mechanical plan for the system, the tag name may be given on the plans.
2. *HVAC System Location or Area Served:* Same data given on MCH-01; provides a brief description of the area served by the duct system (e.g. upstairs; downstairs).
3. *Verified Low Leakage Air-handling Unit (VLLAHU) Credit:* Same data given on PRF-01; Details whether or not VLLAHU is required per PRF-01.
4. *Duct System Compliance Category:* Choose from Completely New, Complete Replacement, or Alteration.
 - a. New: For new buildings with a new HVAC system or replacement of at least 75 percent of the duct system and up to 25 percent consisting of reused parts from the existing duct system (i.e. registers, grilles, boots, air handler, coil, plenums, duct material).
 - b. Alteration: For HVAC changeouts or when the air handler, condensing unit of a split system, or cooling coil or any amount of duct is added to an existing system but does not constitute a new duct system.
 - c. Alteration using Smoke Test: For alterations that are unable to pass the leakage test, a smoke test is allowed to confirm that all accessible leaks have been sealed.

B. Duct Leakage Diagnostic Test - MCH-04c – Low Leakage Air Handling Unit

1. *Condenser Nominal Cooling Capacity (ton):* Enter the condenser nominal cooling capacity, refer to the manufacturer documentation.
2. *Heating Capacity (kBtu/h):* Enter the system heating capacity, refer to the manufacturer documentation.
3. *Leakage Factor:* Depending on answer to A04 the leakage factor will be either .06 or .15.
4. *Air-Handling Unit Airflow (AHU Airflow) Determination Method:* User will select from the following options:
 - a. Cooling System Method: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity (See Section NA2.1.4.1 of the 2013 Nonresidential Appendices).
 - b. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/hr of rated heating output capacity (See Section NA2.1.4.1 of the 2013 Nonresidential Appendices)..
5. *Calculated Target Allowable Duct Leakage Rate (cfm):* This value will be automatically populated depending on values in B04.
6. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm):* User will input this value from actual measurements from leakage test.
7. *Air Handling Unit Manufacturer Name:* Enter the name of the certified low leakage air handler unit; the unit must be listed by the California Energy Commission as a low leakage air handler.
8. *Air Handling Unit Model Number:* Enter the air handling unit; the unit must be listed by the California Energy Commission as a low leakage air handler unit.
9. *Compliance Statement:* If Actual Duct Leakage Rate from leakage test (B06) is less than or equal to Calculated Target Allowable Duct Leakage Rate (B05), "System passes leakage test" will automatically populate. If not, "System fails leakage test" will automatically populate

A. System Information		
01	HVAC System Identification or Name:	<<user input, text, maximum 50 characters>>
02	HVAC System Location or Area Served:	<<user input, text, maximum 50 characters>>
03	Verified Low Leakage Air-handling Unit Credit from NRCC-PRF-01-E?	<<calculated result: (= true or false depending on NRCC-PRF-01-E data: if true =>display message directing use of <u>VLLAHU</u> method 04c)>>
04	Duct System Compliance Category:	<<user pick one from list: <u>New</u> ; or <u>Alteration</u> ; or <u>Alteration using Smoke Test</u> ;>>
05	determine compliance method for this document; display applicable tables below; (this row not visible to user)	<<Calculated Result: if A04= <u>Alteration using Smoke Test</u> ; then display method: 20e. Altered Duct System using Smoke Test if A04= <u>Alteration</u> ; then display method: 20d. Altered Duct System elseif A04= <u>New</u> and A03= <u>VLLAHU</u> (true); then display method: 20c. Low Leakage Air-Handling Unit elseif A04= <u>New</u> then display method: 20a. Completely New Duct System >>

B. Duct Leakage Diagnostic Test - MCH-04c –Low Leakage Air Handling Unit		
01	Condenser Nominal Cooling Capacity (ton)	<<user input, text, maximum 50 characters>>
02	Heating Capacity (kBtu/h)	<<user input, text, maximum 50 characters>>
03	LeakageFactor ()	<<calculated field: if A04= <u>New</u> ; then LeakageFactor= <u>0.06</u> ; else <u>error message</u> if invalid entries for arguments>>
04	Air-Handling Unit Airflow (AHUAirflow) Determination Method	<<pick one from list: <u>CoolingSystemMethod</u> ; <u>HeatingSystemMethod</u> ;>>
05	Calculated Target Allowable Duct Leakage Rate (cfm)	<<calculated field: numeric xxx: if B04= <u>CoolingSystemMethod</u> then <u>AHUAirflow=CondenserNomCoolCapacityTon*400* LeakageFactor</u> ; elseif B04= <u>HeatingSystemMethod</u> then <u>AHUAirflow=HeatingCapacityKbtuh*21.7* LeakageFactor</u> >>
06	Actual duct leakage rate from leakage test measurement (cfm)	<<user input: numeric xxx.x>>
07	Air-Handling Unit Manufacturer Name	<<user input, text, maximum 50 characters>>
08	Air-Handling Unit Model Number	<<user input, text, maximum 50 characters>>
09	Compliance statement: <<if B06 is < or = to B05: "system passes leakage test"; else if B06 is > B05: "system fails leakage test">>	

C. ADDITIONAL REQUIREMENTS FOR COMPLIANCE**The responsible persons signature on this document indicates the installation complies with the following requirements:**

01	System was tested in its normal operation condition. No temporary taping allowed.
02	All supply and return register boots were sealed to the drywall.
03	If cloth backed tape was used it was covered with Mastic and draw bands.
04	All connection points between the air handler and the supply and return plenums are completely sealed.
05	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.

For information and data collection
only. Not valid until registered with a
HERS provider

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-NRCV-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		NRCV-MCH-04-H
Duct Leakage Diagnostic Test		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

A. System Information

01	HVAC System Identification or Name:	
02	HVAC System Location or Area Served:	
03	Verified Low Leakage Air-handling Unit Credit from NRCC-PRF-01-E?	
04	Duct System Compliance Category:	

B. Duct Leakage Diagnostic Test - MCH-04d - Alteration

01	Condenser Nominal Cooling Capacity (ton)	
02	Heating Capacity (kBtu/h)	
03	Leakage Factor ()	
04	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
05	Calculated Target Allowable Duct Leakage Rate (cfm)	
06	Actual duct leakage rate from leakage test measurement (cfm)	
07	Compliance statement:	

C. ADDITIONAL REQUIREMENTS FOR COMPLIANCE

The responsible persons signature on this document indicates the installation complies with the following requirements:

01	System was tested in its normal operation condition. No temporary taping allowed.
02	All supply and return register boots were sealed to the drywall.
03	If cloth backed tape was used it was covered with Mastic and draw bands.
04	All connection points between the air handler and the supply and return plenums are completely sealed.
05	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-NRCV-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		NRCV-MCH-04-H
Duct Leakage Diagnostic Test		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Verification documentation is accurate and complete.	
Name:	Signature:
Company:	Date:
Address:	CEA / HERS Certification Identification (If applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
<ul style="list-style-type: none"> I certify the following under penalty of perjury, under the laws of the State of California: <ol style="list-style-type: none"> The information provided on this Certificate of Verification is true and correct. I am the certified HERS Rater who performed the verification identified and reported on this Certificate of Verification (responsible rater). The installed features, materials, components, manufactured devices, or system performance diagnostic results that require HERS verification identified on this Certificate of Verification comply with the applicable requirements in Reference Nonresidential Appendices NA1 and NA2, and the requirements specified on the Certificate of Compliance for the building approved by the enforcement agency. The information reported on applicable sections of the Certificate(s) of Installation (NRCI), signed and submitted by the person(s) responsible for the construction or installation conforms to the requirements specified on the Certificate(s) of Compliance (NRCC) approved by the enforcement agency. I will ensure that a registered copy of this Certificate of Verification shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Verification is required to be included with the documentation the builder provides to the building owner at occupancy. 	
BUILDER OR INSTALLER INFORMATION AS SHOWN ON THE CERTIFICATE OF INSTALLATION	
Company Name (Installing Subcontractor or General Contractor or Builder/Owner):	
Responsible Builder/Installer Name:	CSLB License:
HERS PROVIDER DATA REGISTRY INFORMATION	
Sample Group Number (if applicable):	Dwelling Test Status in Sample Group (if applicable)
HERS RATER INFORMATION	
HERS Rater Company Name:	
Responsible Rater's Name:	Responsible Rater's Signature:
Responsible Rater's Certification Number w/ this HERS Provider	Date Signed:

A. System Information

1. *HVAC System Identification or Name*: Same data given on MCH-01; provides an identification name or tag name that uniquely identifies the duct system. If there is a mechanical plan for the system, the tag name may be given on the plans.
2. *HVAC System Location or Area Served*: Same data given on MCH-01; provides a brief description of the area served by the duct system (e.g. upstairs; downstairs).
3. *Verified Low Leakage Air-handling Unit (VLLAHU) Credit*: Same data given on PRF-01; Details whether or not VLLAHU is required per PRF-01.
4. *Duct System Compliance Category*: Choose from Completely New, Complete Replacement, or Alteration.
 - a. New: For new buildings with a new HVAC system or replacement of at least 75 percent of the duct system and up to 25 percent consisting of reused parts from the existing duct system (i.e. registers, grilles, boots, air handler, coil, plenums, duct material).
 - b. Alteration: For HVAC changeouts or when the air handler, condensing unit of a split system, or cooling coil or any amount of duct is added to an existing system but does not constitute a new duct system.
 - c. Alteration using Smoke Test: For alterations that are unable to pass the leakage test, a smoke test is allowed to confirm that all accessible leaks have been sealed.

B. Duct Leakage Diagnostic Test - MCH-04d - Alteration

1. *Condenser Nominal Cooling Capacity (ton)*: Enter the condenser nominal cooling capacity, refer to the manufacturer documentation.
2. *Heating Capacity (kBtu/h)*: Enter the system heating capacity, refer to the manufacturer documentation.
3. *Leakage Factor*: Depending on answer to A04 the leakage factor will be either .06 or .15.
4. *Air-Handling Unit Airflow (AHU Airflow) Determination Method*: User will select from the following options:
 - a. Cooling System Method: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity (See Section NA2.1.4.1 of the 2013 Nonresidential Appendices).
 - b. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/hr of rated heating output capacity (See Section NA2.1.4.1 of the 2013 Nonresidential Appendices)..
5. *Calculated Target Allowable Duct Leakage Rate (cfm)*: This value will be automatically populated depending on values in B04.
6. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm)*: User will input this value from actual measurements from leakage test.
7. *Compliance Statement*: If Actual Duct Leakage Rate from leakage test (B06) is less than or equal to Calculated Target Allowable Duct Leakage Rate (B05), "System passes leakage test" will automatically populate. If not, "System fails leakage test" will automatically populate.

CERTIFICATE OF VERIFICATION - DATA FIELD DEFINITIONS AND CALCULATIONS	NRCV-MCH-04-H
Duct Leakage Diagnostic Test - MCH-04d	Page 1 of 1

A. System Information		
01	HVAC System Identification or Name:	<<user input, text, maximum 50 characters>>
02	HVAC System Location or Area Served:	<<user input, text, maximum 50 characters>>
03	Verified Low Leakage Air-handling Unit Credit from NRCC-PRF-01-E?	<<calculated result: (= true or false depending on NRCC-PRF-01-E data: if true => display message directing use of <u>VLLAHU</u> method 04c)>>
04	Duct System Compliance Category:	<<user pick one from list: <u>New</u> ; or <u>Alteration</u> ; or <u>Alteration using Smoke Test</u> ; >>
05	determine compliance method for this document; display applicable tables below; (this row not visible to user)	<<Calculated Result: if A04= <u>Alteration using Smoke Test</u> ; then display method: 20e. Altered Duct System using Smoke Test if A04= <u>Alteration</u> ; then display method: 20d. Altered Duct System elseif A04= <u>New</u> and A03= <u>VLLAHU</u> (true); then display method: 20c. Low Leakage Air-Handling Unit elseif A04= <u>New</u> then display method: 20a. Completely New Duct System >>

B. Duct Leakage Diagnostic Test - MCH-04d - Alteration		
01	Condenser Nominal Cooling Capacity (ton)	<<user input, text, maximum 50 characters>>
02	Heating Capacity (kBtu/h)	<<user input, text, maximum 50 characters>>
03	LeakageFactor ()	<<calculated field: if A04= <u>Alteration</u> ; then LeakageFactor=0.15; else <u>error message</u> if invalid entries for arguments>>
04	Air-Handling Unit Airflow (AHUAirflow) Determination Method	<<pick one from list: <u>CoolingSystemMethod</u> ; <u>HeatingSystemMethod</u> ; >>
05	Calculated Target Allowable Duct Leakage Rate (cfm)	<<calculated field: numeric xxx: if B04= <u>CoolingSystemMethod</u> then <u>AHUAirflow=CondenserNomCoolCapacityTon*400* LeakageFactor</u> ; elseif B04= <u>HeatingSystemMethod</u> then <u>AHUAirflow=HeatingCapacityKbtuh*21.7* LeakageFactor</u> >>
06	Actual duct leakage rate from leakage test measurement (cfm)	<<user input: numeric xxx.x>>
07	Compliance statement: <<if B06 is < or = to B05: "system passes leakage test"; else if B06 is > B05: "system fails leakage test">>	

C. ADDITIONAL REQUIREMENTS FOR COMPLIANCE	
The responsible persons signature on this document indicates the installation complies with the following requirements:	
01	System was tested in its normal operation condition. No temporary taping allowed.
02	All supply and return register boots were sealed to the drywall.
03	If cloth backed tape was used it was covered with Mastic and draw bands.
04	All connection points between the air handler and the supply and return plenums are completely sealed.
05	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-NRCV-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCV-MCH-04-H
Duct Leakage Diagnostic Test		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

A. System Information

01	HVAC System Identification or Name:	
02	HVAC System Location or Area Served:	
03	Verified Low Leakage Air-handling Unit Credit from NRCC-PRF-01-E?	
04	Duct System Compliance Category:	

B. Duct Leakage Diagnostic Test - MCH-04e - Sealing All Accessible Leaks using Smoke Test

01	Condenser Nominal Cooling Capacity (ton)	
02	Heating Capacity (kBtu/h)	
03	LeakageFactor ()	
04	Air-Handling Unit Airflow (AHUAirflow) Determination Method	
05	Calculated Target Allowable Duct Leakage Rate (cfm)	
06	Actual duct leakage rate from leakage test measurement (cfm)	
07	Compliance statement:	

C. ADDITIONAL REQUIREMENTS FOR COMPLIANCE

The responsible persons signature on this document indicates the installation complies with the following requirements:		
01	System was tested in its normal operation condition. No temporary taping allowed.	
02	All supply and return register boots were sealed to the drywall.	
03	If cloth backed tape was used it was covered with Mastic and draw bands.	
04	All connection points between the air handler and the supply and return plenums are completely sealed.	
05	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.	

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-NRCV-MCH-04-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF INSTALLATION		NRCV-MCH-04-H
Duct Leakage Diagnostic Test		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS Certification Identification (If applicable):	
City/State/Zip:	Phone:	
RESPONSIBLE PERSON'S DECLARATION STATEMENT		
<p>I certify the following under penalty of perjury, under the laws of the State of California:</p> <ol style="list-style-type: none"> The information provided on this Certificate of Installation is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the scope of construction or installation, in the applicable classification, for the scope of work specified on this Certificate of Installation (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency. I understand that a HERS rater will check the installation to verify compliance, and that if such checking identifies defects; I am required to take corrective action at my expense. I understand that Energy Commission and HERS Provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met. I will ensure that a registered copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. 		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

A. System Information

1. *HVAC System Identification or Name*: Same data given on MCH-01; provides an identification name or tag name that uniquely identifies the duct system. If there is a mechanical plan for the system, the tag name may be given on the plans.
2. *HVAC System Location or Area Served*: Same data given on MCH-01; provides a brief description of the area served by the duct system (e.g. upstairs; downstairs).
3. *Verified Low Leakage Air-handling Unit (VLLAHU) Credit*: Same data given on PRF-01; Details whether or not VLLAHU is required per PRF-01.
4. *Duct System Compliance Category*: Choose from Completely New, Complete Replacement, or Alteration.
 - a. New: For new buildings with a new HVAC system or replacement of at least 75 percent of the duct system and up to 25 percent consisting of reused parts from the existing duct system (i.e. registers, grilles, boots, air handler, coil, plenums, duct material).
 - b. Alteration: For HVAC changeouts or when the air handler, condensing unit of a split system, or cooling coil or any amount of duct is added to an existing system but does not constitute a new duct system.
 - c. Alteration using Smoke Test: For alterations that are unable to pass the leakage test, a smoke test is allowed to confirm that all accessible leaks have been sealed.

B. Duct Leakage Diagnostic Test - MCH-04e – Sealing All Accessible Leaks Using Smoke Test

1. *Condenser Nominal Cooling Capacity (ton)*: Enter the condenser nominal cooling capacity, refer to the manufacturer documentation.
2. *Heating Capacity (kBtu/h)*: Enter the system heating capacity, refer to the manufacturer documentation.
3. *Leakage Factor*: Depending on answer to A04 the leakage factor will be either .06 or .15.
4. *Air-Handling Unit Airflow (AHU Airflow) Determination Method*: User will select from the following options:
 - a. Cooling System Method: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity (See Section NA2.1.4.1 of the 2013 Nonresidential Appendices).
 - b. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/hr of rated heating output capacity (See Section NA2.1.4.1 of the 2013 Nonresidential Appendices)..
5. *Calculated Target Allowable Duct Leakage Rate (cfm)*: This value will be automatically populated depending on values in B04.
6. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm)*: User will input this value from actual measurements from leakage test.
7. *Compliance Statement*: If Actual Duct Leakage Rate from leakage test (B06) is less than or equal to Calculated Target Allowable Duct Leakage Rate (B05), "System passes leakage test" will automatically populate. else if measured leakage rate is greater than target allowable leakage rate then display message: "System passes using smoke test of an altered HVAC system in an existing building
 - No visible smoke exits the accessible portions of the duct system.
 - Smoke is only emanating from air-handling unit (AHU) cabinet and non accessible portions of the duct system.

Note – Accessible is defined as having access thereto, but which first may require removal or opening of access panels, doors, or moving similar obstructions. If access to the ducts requires an object to be demolished or deconstructed then sealing of those ducts is not required."

CERTIFICATE OF INSTALLATION - DATA FIELD DEFINITIONS AND CALCULATIONS	NRCV-MCH-04-H
Duct Leakage Diagnostic Test - MCH-04e	Page 1 of 2

A. System Information		
01	HVAC System Identification or Name:	<<user input, text, maximum 50 characters>>
02	HVAC System Location or Area Served:	<<user input, text, maximum 50 characters>>
03	Verified Low Leakage Air-handling Unit Credit from NRCC-PRF-01-E?	<<calculated result: (= true or false depending on NRCC-PRF-01-E data: if true =>display message directing use of <u>VLLAHU</u> method 04c)>>
04	Duct System Compliance Category:	<<user pick one from list: <u>New</u> ; or <u>Alteration</u> ; or <u>Alteration using Smoke Test</u> ;>>
05	determine compliance method for this document; display applicable tables below; (this row not visible to user)	<<Calculated Result: if A04= <u>Alteration using Smoke Test</u> ; then display method: 20e. Altered Duct System using Smoke Test if A04= <u>Alteration</u> ; then display method: 20d. Altered Duct System elseif A04= <u>New</u> and A03= <u>VLLAHU</u> (true); then display method: 20c. Low Leakage Air-Handling Unit elseif A04= <u>New</u> then display method: 20a. Completely New Duct System >>

B. Duct Leakage Diagnostic Test - MCH-04e - Sealing All Accessible Leaks using Smoke Test		
01	Condenser Nominal Cooling Capacity (ton)	<<user input, text, maximum 50 characters>>
02	Heating Capacity (kBtu/h)	<<user input, text, maximum 50 characters>>
03	LeakageFactor ()	<<calculated field: if A04= <u>Alteration using Smoke Test</u> ; then LeakageFactor= <u>0.15</u> ; else <u>error message</u> if invalid entries for arguments>>
04	Air-Handling Unit Airflow (AHUAirflow) Determination Method	<<pick one from list: <u>CoolingSystemMethod</u> ; <u>HeatingSystemMethod</u> ;>>
05	Calculated Target Allowable Duct Leakage Rate (cfm)	<<calculated field: numeric xxx: if B04= <u>CoolingSystemMethod</u> then <u>AHUAirflow=CondenserNomCoolCapacityTon*400* LeakageFactor</u> ; elseif B04= <u>HeatingSystemMethod</u> then <u>AHUAirflow=HeatingCapacityKbtuh*21.7* LeakageFactor</u> >>
06	Actual duct leakage rate from leakage test measurement (cfm)	<<user input: numeric xxx.x>>
07	Compliance statement: <<if measured leakage (B06) is <or= to target allowed (B05), then display message: "system passes - system complies with Allowable Duct Leakage Rate criterion"; else if measured leakage rate is greater than target allowable leakage rate then display message: "System passes using smoke test of an altered HVAC system in an existing building <ul style="list-style-type: none"> No visible smoke exits the accessible portions of the duct system. Smoke is only emanating from air-handling unit (AHU) cabinet and non accessible portions of the duct system. Note – Accessible is defined as having access thereto, but which first may require removal or opening of access panels, doors, or moving similar obstructions. If access to the ducts requires an object to be demolished or deconstructed then sealing of those ducts is not required.">>	

C. ADDITIONAL REQUIREMENTS FOR COMPLIANCE**The responsible persons signature on this document indicates the installation complies with the following requirements:**

01	System was tested in its normal operation condition. No temporary taping allowed.
02	All supply and return register boots were sealed to the drywall.
03	If cloth backed tape was used it was covered with Mastic and draw bands.
04	All connection points between the air handler and the supply and return plenums are completely sealed.
05	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.

For information and data collection
only. Not valid until registered with a
HERS provider

HIGH RISE RESIDENTIAL/HOTEL/MOTEL CENTRAL HOT WATER SYSTEM DISTRIBUTION

CEC-NRCV-PLB-21-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		NRCV-PLB-21-H
High Rise Residential/Hotel/Motel Central Hot Water System Distribution		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Note: HERS rater required to submit this document for each system that must demonstrate compliance. Document must be registered with HERS provider.	Enforcement Agency Use: Checked by/Date
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A. SYSTEM TYPE	
01	HERS-Verified Multiple Recirculation Loops for DHW Systems Serving Multiple Dwelling Units

B. HERS VERIFICATION MANDATORY MEASURES FOR ALL CENTRAL DOMESTIC HOT WATER RECIRCULATION SYSTEMS	
01	Outlet temperature controls: On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed in the ASHRAE Handbook shall have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature. (Section 110.3 (c)1)
02	Controls for hot water distribution systems: Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (Section 110.3(c)2).
03	Unfired Storage Tanks are insulated with an external R-12 or combination of R-16 internal and external Insulation. (Section 110.3(c)4).
04	Automatic Air release valve is installed on the inlet side of the recirculation pump per Section 110.3(c)5A.
05	A check valve is located between the recirculation pump and the water heater per Section 110.3(c)5B.
06	Hose bibb is installed between the pump and the water heating equipment with an isolation valve between the hose bibb and the water heating equipment per Section 110.3(c)5C.
07	Isolation valves are installed on both sides of the pump. One of the isolation valves may be the same isolation valve as in item 6 above per Section 110.3(c)5D.
08	The cold water supply piping and the recirculation loop piping is not connected to the hot water storage tank drain port per Section 110.3(c)5E.
09	A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply per Section 110.3(c)5F.
10	System must have a dedicated return line which is insulated.(Section:120.3)
11	All hot water pipes are insulated per the insulation requirements of Table 120.3A(Section 120.3)(1" insulation for 1" and smaller pipes. 1.5" insulation for 1 to 1.5 inch pipes)
The HERS rater certifies that the above inform is met.	

C. HERS-VERIFIED MULTIPLE RECIRCULATION LOOPS FOR DHW SYSTEMS SERVING MULTIPLE DWELLING UNITS	
01	All buildings with 8 or more dwelling units have a minimum 2 recirculation loops.
02	Each loop roughly serves the same number of dwellings.
03	Each loop will have its own pump and controls
The HERS rater certifies that the above inform is met.	

HIGH RISE RESIDENTIAL/HOTEL/MOTEL CENTRAL HOT WATER SYSTEM DISTRIBUTION

CEC-NRCV-PLB-21-H (Revised 06/13)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		NRCV-PLB-21-H
High Rise Residential/Hotel/Motel Central Hot Water System Distribution		(Page 2 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Verification documentation is accurate and complete.	
Name:	Signature:
Company:	Date:
Address:	CEA / HERS Certification Identification (If applicable):
City/State/Zip:	Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT	
1. I certify the following under penalty of perjury, under the laws of the State of California: 1. The information provided on this Certificate of Verification is true and correct. 2. I am the certified HERS Rater who performed the verification identified and reported on this Certificate of Verification (responsible rater). 3. The installed features, materials, components, manufactured devices, or system performance diagnostic results that require HERS verification identified on this Certificate of Verification comply with the applicable requirements in Reference Nonresidential Appendices NA1 and NA2, and the requirements specified on the Certificate of Compliance for the building approved by the enforcement agency. 4. The information reported on applicable sections of the Certificate(s) of Installation (NRCI), signed and submitted by the person(s) responsible for the construction or installation conforms to the requirements specified on the Certificate(s) of Compliance (NRCC) approved by the enforcement agency. 5. I will ensure that a registered copy of this Certificate of Verification shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Verification is required to be included with the documentation the builder provides to the building owner at occupancy.	
BUILDER OR INSTALLER INFORMATION AS SHOWN ON THE CERTIFICATE OF INSTALLATION	
Company Name (Installing Subcontractor or General Contractor or Builder/Owner):	
Responsible Builder/Installer Name:	CSLB License:
HERS PROVIDER DATA REGISTRY INFORMATION	
Sample Group Number (if applicable):	Dwelling Test Status in Sample Group (if applicable)
HERS RATER INFORMATION	
HERS Rater Company Name:	
Responsible Rater's Name:	Responsible Rater's Signature:
Responsible Rater's Certification Number w/ this HERS Provider	Date Signed:

CERTIFICATE OF VERIFICATION - DATA FIELD DEFINITIONS AND CALCULATIONS	NRCV-PLB-21-H
High Rise Residential/Hotel/Motel Central Hot Water System Distribution	(Page 1 of 1)

A. SYSTEM TYPE	
01	HERS-Verified Multiple Recirculation Loops for DHW Systems Serving Multiple Dwelling Units

B. HERS VERIFICATION REQUIREMENTS FOR ALL CENTRAL DOMESTIC HOT WATER RECIRCULATION SYSTEMS << Table B appears in all cases; line 12 and line 13 only appears if Building Type from NRCC-PLB-01 is High Rise Residential/Hotel/Motel >>	
01	Outlet temperature controls: On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed in the ASHRAE Handbook shall have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature. (Section 110.3 (c)1)
02	Controls for hot water distribution systems: Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (Section 110.3(c)2).
03	Unfired Storage Tanks are insulated with an external R-12 or combination of R-16 internal and external Insulation. (Section 110.3(c)4).
04	Automatic Air release valve is installed on the inlet side of the recirculation pump per Section 110.3(c)5A.
05	A check valve is located between the recirculation pump and the water heater per Section 110.3(c)5B.
06	Hose bibb is installed between the pump and the water heating equipment with an isolation valve between the hose bibb and the water heating equipment per Section 110.3(c)5C.
07	Isolation valves are installed on both sides of the pump. One of the isolation valves may be the same isolation valve as in item 6 above per Section 110.3(c)5D.
08	The cold water supply piping and the recirculation loop piping is not connected to the hot water storage tank drain port per Section 110.3(c)5E.
09	A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply per Section 110.3(c)5F.
10	System must have a dedicated return line which is insulated.(Section:120.3)
11	All hot water pipes are insulated per the insulation requirements of Table 120.3A(Section 120.3)(1" insulation for 1" and smaller pipes. 1.5" insulation for 1 to 1.5 inch pipes)
The HERS rater certifies that the above inform is met.	

C. HERS-VERIFIED MULTIPLE RECIRCULATION LOOPS FOR DHW SYSTEMS SERVING MULTIPLE DWELLING UNITS	
01	All buildings with 8 or more dwelling units have a minimum 2 recirculation loops.
02	Each loop roughly serves the same number of dwellings.
03	Each loop will have its own pump and controls
The HERS rater certifies that the above inform is met.	